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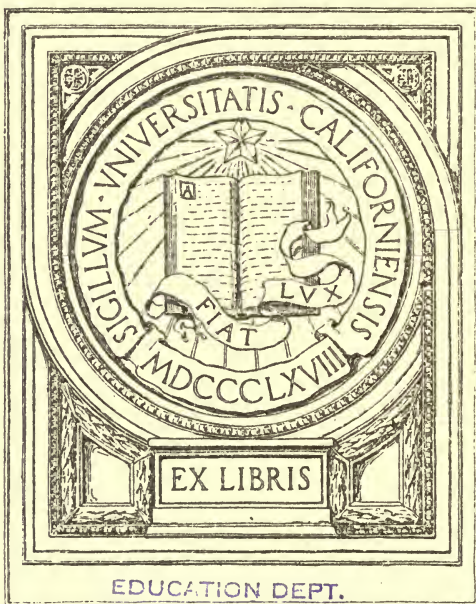
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FOOD AND LIFE



Lansing - Gulick

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FOOD AND LIFE

BY

MARION FLORENCE LANSING

IN COLLABORATION WITH

LUTHER HALSEY GULICK

GINN AND COMPANY

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PREFACE

Children have a normal, spontaneous interest in food. To a child each meal is a matter of fresh and vital consequence. His own experience prepares him to appreciate that what he eats has a direct and important bearing on his health and comfort. He responds readily to a call to take a more intelligent interest and a more active concern in his food needs and habits. War did a real service in bringing people back from the conventionally remote attitude of modern civilization to a vivid realization of the interest and importance of this universal human need. It drove home also the truth that while their elders have a responsibility for children's food, children have in their own right a relation of their own to this as to other concerns of daily life.

To Dr. Gulick there came as an inspiration the vision of a new rating of boys and girls in all their social relations. He saw them not only as "futures," not only as potential citizens and homemakers, but as "presents," contributing everywhere by doing their part as boys and girls. To him the book owes its inspiration and inception. His faith in the power of boys and girls as an effective factor in national life and service was amply justified during the war. To-day the government is making every effort to capitalize this youthful enthusiasm and persistence as a permanent asset in our individual and

community life, and as a part of our national share in banishing famine, waste, and misery from the world brotherhood. This book is intended to aid in that movement.

From its pages the child will learn the facts he should know concerning the great Food Business into which he is born and in which he is a partner. He will be led to see the need of his becoming an intelligent and active partner. He will come into a sense of the world brotherhood which is the hope of the future. The ethical side is often more natural to the child than the technical details. There is hardly a virtue or an ideal of family, community, and world life which does not take a natural place in a study of the fundamental human problem of food. The actual facts are most interesting when presented simply and entertainingly. Knowledge recently contributed by science has made this a new subject, and one far more readily grasped by boys and girls than it could have been five or even two years ago. With a sufficient amount of information to make the book a complete and satisfying whole, the aim has been to suggest as well as to inform. From this book the child goes to the geography lesson, to the physiology and domestic-science class, to the garden, to the store, and to the home with a newly awakened interest. Not only does he *know*; knowing, he is stimulated at each point to *do*. The chapters will serve their purpose best if the knowledge each imparts is a stimulus, not an end. Together they provide the necessary background of information, education, and inspiration for the child's life as it relates to and is interpreted by his food.

M. F. L.

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THE FRUGAL MEAL
From a painting by Joseph Israels



FOOD AND LIFE

CHAPTER I

A LIFE BUSINESS

Boys and girls often talk over what they will do in life. They wonder what calling they will follow when they are men and women. There is one business into which everyone is born, a business which everyone will surely follow all his life. This is the food business. Three times a day, seven days in the week, fifty-two weeks in the year,—to say nothing of odd times between,—every boy and girl, every man and woman, wishes, expects, and needs food. To get this food is man's chief business in life. So it must always be. When this is attended to, then and then only can he go about other matters.

To enter into this business you who read this book need not make a special request or application to-day. You did that long ago. From the moment when as a tiny baby you first cried for food, you have been enrolled on its lists. The minute you were born, Life, the manager of this business firm or company, took you into partnership and set you to work. So it takes

into partnership every living thing, whether it be plant or animal. Without food existence is impossible. No plant is so independent that it can live without food; no animal body is so built that it can go more than a short time without nourishment.

When a young man is received into a business, he is expected to take some share in carrying it on. You have done a good bit of work in the company already. When you were born you weighed seven or eight or nine pounds. In a few months you doubled that weight. Think how much you weigh now. All this weight and growth have come directly from the food you have eaten. That you have used this food well is shown by the fact that you are strong and healthy and that you weigh six, seven, or eight times as much as you did in the first weeks or months of your life. It is a good business partner who can make such big returns in a few short years.

Man's section of this great food enterprise of the world has three main departments. One has for its headquarters the land; here the food must be raised. In this department Nature takes the heavier share of the work, man doing only a small assisting part. In the second department man is the active agent. He acts as middleman, delivering the food which has been grown on the land to the human body in a form in which it can be taken. The food is bought or exchanged, transported, prepared, cooked, and served. Commerce, conservation, coöperation, all are needed



U. S. Food Administration

" IT TAKES ALL SORTS OF PEOPLE TO FEED THE WORLD "

here. The third department has as many separate stations as there are people in the world. In each human body the food must be eaten, digested, and distributed.

It is interesting to be in business. You have found it so already. You will find it increasingly so the more you know about this business and the more you share in it. Let us check up the part which you as a boy or girl can have. Let us see what part you are already having.

In the third department—the eating department—you give place to no one. Food is one of the chief joys of life to hungry boys and girls. You want it, you enjoy it, and, as the old phrase goes, it agrees with you. You turn it to the best of use. You grow tall and broaden out each year until you are of age and have reached your natural limit of growth.

In the second department—the buying, preparing, cooking, and serving—you are having an increasing part each year. In the first department—the raising of food—your garden entitles you to a place. There is, then, not a single division in this great world business, except perhaps the buying, where you must wait to take any share until you are grown up. You are in each department now.

If you are partners in a business, you cannot afford not to know about it. The only way an office-boy ever works up to a higher position is by finding out all about the departments in which he is working.

This book is to tell you about this huge Food Concern, with its powerful silent partners, Nature and Life, and its active agents, of whom each of you is one. It will tell the facts that you must know in order to succeed in your part of the business; it will show you what other agents are doing and how you can work with them; it will help you to get the biggest returns out of your partnership and do your utmost to make this great world Food Business succeed.

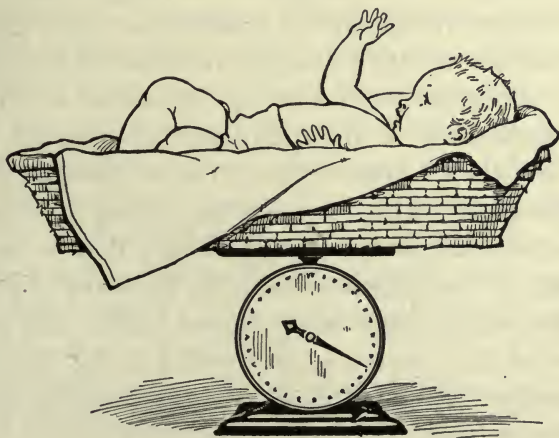
QUESTIONS

What is the one business in which every human being must take part?

What are its three departments?

In how many of its departments have you taken a share?

How much have you increased in weight since you were born?



CHAPTER II

THE FOOD TETHER

Need for food is a tether which keeps man tied to the land. Columbus was able to discover America because he could take in the holds of his ships food enough to keep his crew alive until he reached shore. As often as his men grew discouraged they would begin to figure on the food supply. "We have sailed for so many days and eaten so much food," they would say. "We can sail home safely on the food we have. If we keep on and do not find land, we shall run short of food and die." Just as we are learning to-day that a hungry nation tends toward anarchy, so every explorer of that day knew that a hungry crew was always ripe for mutiny. The success of a voyage depended on whether the leader's faith in the unknown land ahead could hold the balance true against the discouraging pull upon the spirits of his men of a decreasing food supply.

So much food, so many days of life: that is the rule. As a man is held down to earth by the force of gravity, which keeps him from being tossed hither and yon by every wind that blows, so he is held to his home and his everyday life by this tether. It anchors him as firmly as a cord ever held a flying kite.

You know the story of the old-time giant Antæus, the famous wrestler, who renewed his strength every time he touched earth. Even so man is held to the land. Hercules overcame the giant by holding him up from the earth. Think what circumstances draw men away from their food supply. War is one; city life is another; flood or earthquake or similar natural disasters may be others. We shall talk about some of them later.

Man's tether is longer than that of any other living creature. He owes its length to his adaptable body and his clever mind. In food necessities, as in the matter of climate, he is wonderfully adaptable. Most birds and animals eat only a few kinds of food; man eats almost anything that any member of the animal world eats. Next to man the English sparrow, the dog, and the cat are said to be most adaptable in their food requirements. Matching the marvelous body machine, which can make use of almost any kind of foodstuff, is the clever mind, which has devised ways to prepare, store, preserve, and transport food. The animal eats raw the food which he finds, and eats it at or near the place where he has found it. Man cooks, dries, cans, and in a thousand ways treats his food to meet his needs. His adaptable body lets him travel and dwell wherever the land is fertile; his ingenious mind enables him to store and carry his food until he is free to encircle the globe.

Peary could reach the north pole because twenty years of study had taught him what food to carry and

in what form to carry it so that his men might bear the strain of that terrible arctic journey. He could go far beyond the usual limit of man's travels. He could leave behind fertile lands where food abounded and go into the wilderness, where little or no food could be found.



TRANSPORTING THE ARCTIC RATION

He planned and selected by a standard which we who live at home need not consider. The food had to occupy as little space and be as light in weight as possible. Every added ounce of weight to be carried took just so much from the needed strength of his men; every foot of the small space on the sledges must be used to the best advantage.

This is what he says about his supplies:

The essentials, and the only essentials, needed in a serious arctic journey, no matter what the season, the temperature, or the duration of the journey — whether one month or six — are

four : pemmican, tea, ship's biscuit, condensed milk. Pemmican is a prepared and condensed food, made from beef, fat, and dried fruits. It may be regarded as the most concentrated and satisfying of all meat foods.

With these essentials Peary packed his sledges to support their crew of men and dogs for the fifty days' dash for the pole. The bottom layer was of dog pemmican in red tins, covering the entire length and width of the sledge; then came two layers of biscuit and of crew pemmican in blue tins. then the condensed milk.

The standard daily ration for work on the final sledge journey towards the pole was one pound of pemmican, one pound of ship's biscuit, four ounces of condensed milk, one-half ounce of compressed tea, and six ounces of liquid fuel (alcohol or petroleum).

This made a total of two pounds, four and a half ounces of solids per man per day. "On this ration," adds Peary, "a man can work hard and keep in good condition in the lowest temperatures for a very long time. I believe that no other item of food, either for heat or muscle building, is needed."

An army can advance from its base of supplies only so far as food can be brought to it. Long ago Napoleon said, "An army travels on its stomach." A friend of mine, who was in Italy as a Red Cross worker at the time of the Austrian surrender, fed in the mountain passes Austrian soldiers who had had no food for five days. No army so poorly provisioned

could hold out. Germany did not believe any army could operate three thousand miles from its base of supplies. Read the army ration of the American soldier in France, the best-fed soldier in the world, and you will see that the despised Yankee taught even the scientific German a lesson in food supply. Compare it with Peary's emergency ration for his fateful fifty days' dash. The total is over four and a half pounds as against Peary's two and a quarter pounds.

The garrison ration of the American soldier was one and a quarter pounds of fresh beef, one and an eighth pounds of flour, one and a quarter pounds of potatoes, and beans, prunes, coffee, sugar, milk, vinegar, salt, pepper, lard, butter, sirup, and baking powder in varying amounts, making a total of about four and a half pounds. Parallel with this list are many substitutes for each article of food. Flour, for instance, is not served by the pound as the grocer would hand it over the counter. That would hardly help the soldier in his food problem. The flour part of the ration appears in bread, hominy, corn meal, crackers, and oatmeal. Prunes are varied with apples, peaches, pears, pineapple, jam, jelly, and "assorted preserves." (The full ration is given on page 164.)

Later we shall talk more about the body ration necessary for continued health and comfort. Now we are interested in the ration as a measure of man's independence. With this amount of food supplied him he could carry on a war anywhere.



From the *Sphere*, London. Copyright in U. S. by N. Y. Herald Co.

FOOD BY AIRPLANE

These besieged soldiers would have starved without their rations

Columbus, Peary, and Pershing had to provide a fixed daily allowance, or ration, because they had taken their men off the land — Columbus out on the sea, Peary over the ice, and Pershing into camps or out across No Man's Land, where they could do nothing



U. S. Official

FOOD FOR A DESERT JOURNEY

to supply themselves with food. Belgium had to be put on rations because its land was laid waste or was in the hands of the enemy. England went on rations because the land area for food cultivation of the British Isles is not sufficient for the feeding of her population. She depends always on food brought from overseas. Before the war it used to be said that she kept three weeks ahead of her needs in provisions. With submarines sinking the incoming food in mid-ocean, she had to put her people on limited rations. China suffers

from famine when the floods cover the rice fields. Whenever people are cut off from the land where their food is raised, the tether pulls them back.

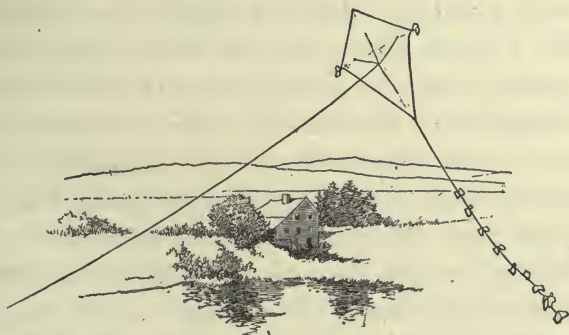
It has been good for man to be pulled up short in this way. Otherwise he might have become a careless, idle, roaming creature. It is good for you that you must report three times a day at table. Many a time you go out saying "I will be back in time for supper" or "for dinner." As the farmer is held to the land which he tills, so all of us are blessedly held to our homes and our work by our need for food.

QUESTIONS

How is man tied to the land?

How has he lengthened his tether?

Why must any people ever be put on rations?



CHAPTER III

IN BUSINESS FOR YOURSELF

Mr. Smith was a candy manufacturer. His son John wanted to go into the business, and Mr. Smith wanted to take him into it. But he wanted John to learn the candy business before he became his partner. So he said to John: "How would it be for me to set you up in business for yourself? I will give you a little factory for your own. I will put in the machinery and buy the supplies to start you. Then you can go ahead and manage it." John wanted the factory. He was eager for the chance. But he did not think that he knew enough about the actual making of the candy to risk it. Mr. Smith saw that John was right. "I will do more," he said. "I will give you one of my best foremen. He knows all about the process of making candy. He will attend to that for you, and your mind will be left free for the other parts of the business."

Nature did the same thing for you that Mr. Smith did for his son. She set you up in business for yourself. She gave you the most wonderful machine in the world—your body. It belongs to you and to no one else. You are in full charge. But Nature did not go away and leave you the whole business of managing it. If you had consciously to manage and direct the

various activities that are going on all the time within your body, you would have no time or thought for anything else. You would be nearly distracted sending your thoughts here and there to see that your heart kept beating, and your lungs kept breathing, and your blood kept moving, and your whole body kept growing. Attending to the food business alone would drive you crazy, for it goes on night and day, Sundays and holidays.

Nature wished your thinking self to be free for other things than the running of your body. So, like Mr. Smith, she gave you a foreman. This foreman is your Other Self; it is really You, for it is part of You, but so, for that matter, is your body You. It is not, however, the thinking, attending, conscious You. It is a Body Self which knows how to run the mechanical processes of your body, and which attends to them whether you are paying attention or not.

We stopped in the middle of Mr. Smith's talk with his son. Mr. Smith was willing to provide John with a foreman, but said: "If you are to be a successful candy manufacturer, you must know every step of the process of candy-making. You must watch the foreman and each worker, and question them until you know exactly what takes place in each room of the factory. You must know not only the raw products (sugar, milk, water, flavoring) and the finished products (candy in pound and five-pound boxes) but also how they are mixed, heated, cooled, molded, and packed. No man

is fit to be at the head of a business who does not have every detail of that business clearly in his mind. He will make mistakes in buying his materials, selling his products, or handling his employees."

It was not hard for John to learn the business. He could go and ask his foreman questions. If man's Body Self had been able to talk, science would have been saved thousands of experiments. But though the Body Self attended to its business and did it well, it kept so quiet about it that the endless curiosity of man down all the centuries hardly sufficed to find out how the food business inside his own body was run.

People had such strange ideas. Philosophers used to sit down and try to imagine what could be happening to this food which they ate. Each day they ate it, and it disappeared. The body into which it was dropped took it in but did not increase in weight. No other vessel could have a thousand or fifteen hundred pounds of matter dropped into it in a year and, except for some waste, give no sign of what became of it. In some way it kept the body alive, but how they could not imagine.

Then came a brilliant group of men who made the body tell some of its secrets. One discovered the circulation of the blood, the river of life flowing into every part of the body. Two others discovered oxygen, that element in the air which combining with other substances "makes them burn." Year after year secrets were uncovered until now you and I can almost hear our Body Selves talk if we let the scientists act as interpreters.

Suppose this Body Self did talk. It might like to tell you, as its chief, some things. Foremen are always going to their chiefs with requests and suggestions. It might even begin by complaining. It might say to you:

"Do you realize the work you are making me do? I must keep your heart beating; that alone is as much



THE NOON LUNCH AT AN OPEN-AIR SCHOOL

Food furnishes heat-energy to keep these children warm

work in a single day as it would be to lift a man twenty-five hundred feet into the air. I must keep your chest moving. I must keep your body warm. All these things I must do, and then I must be ready to supply energy for everything you do. If you kept still I should even then have work enough to do, but you walk and run, you dig in the garden. Sometimes it seems to me as if you were never still a minute."

You do work your foreman hard. You expect a great deal of your body; you are always calling on it for energy. This you may do because you supply it with food. Your foreman will not complain if you give him the materials he needs. He will not waste them; he will even save and store some of them. But he must have them if he is to supply you with the energy you need, first, to keep your body machinery running and, next, to do the work you want to do. This energy your foreman would measure in terms of heat, for heat is a form of energy, and it is heat-energy which keeps your body going.

Paracelsus, a Swiss physician who was born the year after Columbus discovered America, thought there really was a spirit that lived in the stomach and separated the food, the good from the bad. If there were such a spirit living in the stomach, he would not be separating good from bad. First of all he would be testing your food to see how much heat-energy there was stored in it. Each tiny cell in the body is a little furnace. The foodstuff which comes to it from your eating is the "coal"; the oxygen which comes to it through the lungs from your breathing "makes it burn." When coal burns in a stove, carbon in the coal is uniting with oxygen of the air, and as a result energy is given off in the form of heat. Shut off the oxygen, the draft of air, in a stove and the coal will not burn. Let in air through a wide-open draft without putting in much coal and the fire will burn out. The oxygen from your

lungs is ready to meet in the cells the food liquid from your stomach and "burn" in each of a million cells. Then from each of these cells will come the heat-energy which is needed not only to keep your heart beating but to enable you to run and jump and play and work.

This Paracelsus-spirit, sitting in your stomach and watching the food as it came down from your mouth, would have for one of his instruments a food thermometer. It would not be quite like our thermometers. They test temperature by seeing how high a thread of mercury rises. This spirit in the stomach would be testing to see how much heat could be gotten out of each bit of food when it met oxygen in the cells.

When the scientist found out that one of the chief things the body wanted from food was possible heat-energy, he began to test every kind of food for heat-energy. He had it meet oxygen in his tube as it would meet oxygen in the cell. He found that each food responded by giving out a particular amount of heat. So he said to himself: "I will make a food thermometer and measure the food *before* I put it into the body. Then I shall know how much heat it will give out *in* the body." He called his food thermometer by the less familiar name of *calorimeter*, but the two words really mean the same, each being a "heat-measure"—*thermometer* from the Greek word for heat, *calorimeter* from the Latin word for heat.

That was a great day when men found out how to measure food as if it were fuel. After that they could

find out how much fuel the body needed. When they had done that, and learned some other facts, explorers and aviators could plan their emergency rations, the army could select intelligently its fighting ration, and you and I could run our food business properly, giving our bodies the materials they need.

QUESTIONS

How did Nature set you up in business?

What becomes of much of the food we eat?

In what sense may we call the body an engine? What does it do for us?

For what does the body test the food we give to it?



CHAPTER IV

FOOD AS FUEL

It is one thing to drop food into a mysterious cavity like the leather bag of Jack the Giant Killer; it is quite another to supply fuel for a furnace from which a known amount of heat is required. Jack's only concern was that the giant should see a certain amount of food disappear. He could throw in all kinds, hit or miss, the faster the better. Sometimes we are in danger of treating our bodies as if they were Jack's leather bag. Then we do well to remind ourselves that they are furnaces or engines, with food as their fuel. They can be misused more than most furnaces without getting out of order, but even their fires will finally run low if not fed properly or if choked.

We know how much heat we require from the body furnace. Many thousands of tests have established that, until it is a matter of arithmetic like the price of beef or eggs. Do a certain piece of work and you use up a certain number of *calories* of heat. The calorie is the unit of heat as it is measured by the food thermometer, or calorimeter. Get up from the chair in which you are now sitting, walk eight feet, turn, walk back, and sit down again; you will have used about one calorie

of heat more than if you had kept still. A certain number of calories to keep the body going, a smaller number in addition for our voluntary acts like walking, stretching, eating, running, and playing,—such is the requirement for fuel for our body furnace. Every muscle movement that we make uses a certain amount of heat-energy. Boys and girls use up more calories in proportion to their weight than men and women. That is partly because they are growing so fast, partly because they are more active. Here is a table¹ by which you can find out for yourself the number of calories of heat-energy which you require from your body in a day.

AGE	NUMBER OF CALORIES PER DAY
Under 1 year	45 calories per pound
1-2 years	45-40 calories per pound
2-5 years	40-36 calories per pound
6-9 years	36-32 calories per pound
10-13 years	34-27 calories per pound
14-17 years	30-22 calories per pound

To figure out what you require, find your place in the table by age and multiply your weight in pounds by the number of calories opposite your age. Since two numbers are given in the calorie list, multiply first by the first number given, then by the second; somewhere between these two results lies your average daily requirement. Suppose you are ten years old and weigh 60 pounds. In the table, for children from

¹ From H. C. Sherman's "Chemistry of Food and Nutrition," 1918.

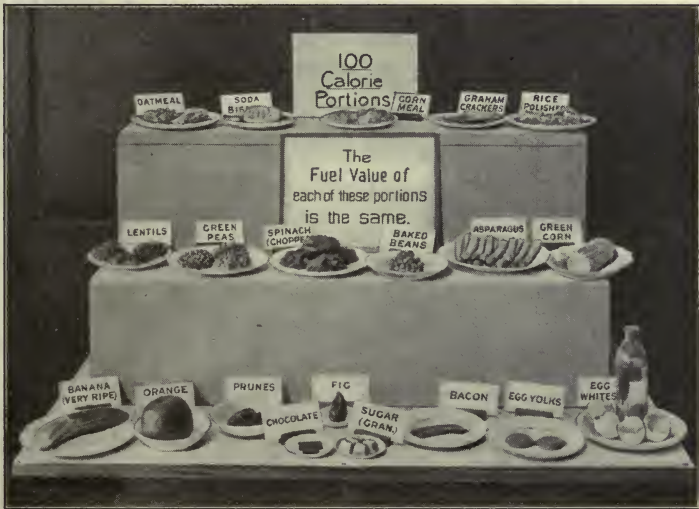


TAKING THE WEEKLY WEIGHT RECORD

ten to thirteen years of age the number of calories is from 34 to 27. Multiplying 34 by 60 we get 2040; multiplying 27 by 60 we get 1620. According to how fast you are growing and how lively you are, you are asking your body to furnish from 1600 to 2000 calories of heat a day. The average for a man of ordinary habits of life is from 2500 to 3000 calories a day. An active farmer uses about 3500, a Maine lumberman at the height of the working season, 5800. A baby, weighing only a few pounds, uses more heat-energy or does more "work" in proportion to its weight than anyone except a very hard-working laborer.

To run your food business properly on the fuel side, you must keep a sort of balance sheet, putting in as much heat in fuel as you take out in energy. When your father is to leave the furnace fire for the day, or when he orders coal for the winter, he does not regulate the amount of coal by guesswork or any haphazard process. He knows by experience about how much coal it takes to keep the fire going at the proper rate all day or all winter, and he supplies that amount. When he goes on a long trip in his automobile, he does not start out blindly, hoping that the gasoline in his tank will keep the engine going and the wheels turning to cover the number of miles of his trip. He balances gallons of gasoline against engine output or, in this case, against miles covered by a given engine output. If the two balance he may, barring accidents, depend on his engine to do the work required.

The output of the body is too varied to be measured in miles; the food fuel cannot be measured in quarts. Both can, however, be measured in these calories, these heat-units. This makes possible a rough figuring of a balance sheet. Two drops of fat contribute a calorie



Women's Municipal League, Boston

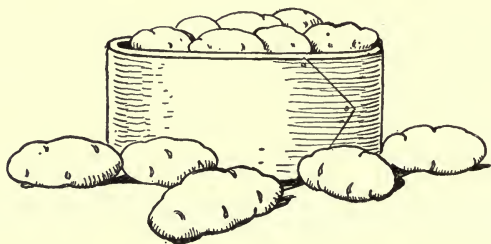
100-CALORIE PORTIONS

See also list, page 170

of heat. Three lumps of sugar furnish extra energy enough for walking a mile. Two slices of bread, or a large boiled egg, or a little over half a cup of milk, or a medium-sized ripe banana — each of these furnishes one hundred calories. The cook or the purchaser of raw or cooked food can easily learn to estimate the fuel value of every food. So interested have people become

in this food-test that many restaurants have added a new column to their menu, giving not only the food and its price but also the number of calories in the portion served.

To most of us eating by calories would be tiresome. We are not mere mechanical machines. We prefer to think of our food as appetizing and hunger-satisfying; we should weary of thinking of it as energy-producing. Yet, when all is said and done, that Body Self of ours will still be checking off what we eat with the food thermometer. To keep the Body Self well supplied is one of our first duties.



CHAPTER V

FOOD AS FUEL (CONTINUED)

The fuel value of a food depends largely on the heat that has gone into its composition. It is the old story that you can take out of a thing only what has been put into it.

Nature is man's first and chief cook. With the heat from her great stove, the sun, she combines or "cooks" in the tiny mixing pots of plants, the cells, the ingredients which go to make up our food. This food has fuel value according to the amount of heat which has been taken up by it in the process of "cooking."

Practically all that we eat is either plant food or animal food, either vegetables, grains, and cereals or meat, fish, eggs, and milk. All foods have some fuel value; some have far more heat-energy stored up in them than others. The fuel value in calories of all common foods has been calculated and can be found in government lists. Let us see if we can tell why some of the plant and animal foods furnish more heat energy than others.

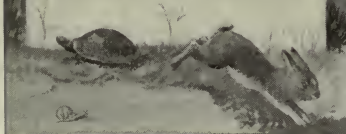
Let us go back to the Long Ago and suppose a time when plants and animals were almost alike. This

sounds like the beginning of a fairy story, but there really are some plants that are so like animals, and some tiny animals that are so like plants, that it takes a microscope and a learned scientist to name one a plant and the other an animal. There were a good many of these living structures made up of tiny cells, and some were going to be animals and some were going to be plants. All of them got their energy from the sun. After the world was started, it had to have some great store of energy to keep it going, and that source of energy is the sun. The sun is giving its energy out freely. It comes in a steady stream to plants and animals alike. Its coming is like money pouring in on a person. The question is, What will he do with it? He must choose to do one of two things, either spend it or keep it to pass on to his children. In the fairy story of Long Ago that I am telling you, suppose that some of these living groups of cells had the question put to them as to what they were going to do with this sun-energy which came to them in sun-heat and sun-light. Whether they were asked the question or not, we know what they did.

Plants said, "We will keep this energy, storing it for our children and for our own use in the days when the sun does not send us its light and heat." Animals said, "We will keep just enough energy to be safe to live on for a short time, but the rest we will spend in free movement as fast as it comes to us." So it happened, and the story ends, as all fairy stories should,



We are Animals
We Spend
We Move



We are Plants
We Save
We Stay Still



THE PARTING OF THE WAYS

with "they lived happy ever after." But the plants had chosen to stay still, and they have stayed still to this day, each one living in its appointed place for its lifetime. The animals had chosen to spend their energy in movement, and they have moved here, there, and everywhere, all over the earth. That is one difference, the big difference, between the Animal Kingdom and the Vegetable Kingdom.

The plants, which are tied to one place, reach out into the air around them and down into the earth beneath them to get the ingredients for their food. With the sun-heat and the sun-light they cook it in their tiny mixing pots, the cells. When it is first cooked it has a great deal of water mixed in with it, and water has no fuel value. But then the plants begin to provide for their seed children, for whom they are saving this "money" that the sun lavishes on them. They begin to pack away this wealth of energy for them, and wherever you and I can find it packed away, there we shall find a food with heat in it, a food of good fuel value.

The potato is one such food. It is a storeroom with plenty of starch put away for the sprouts (which are to come from the eyes of the potato) to live on until they are big enough to get energy from the sun for themselves. All kinds of seeds and bulbs which are good to eat have high fuel value, for around the germ of life the plant always packs a good supply of starch. That is why beans and peas, grains, cereals

(wheat, barley, rye, oats, rice, and all their products in bread, crackers, and breakfast foods), are good fuel foods. They are rich in starch, which is the product into which the sun-energy has transformed their ingredients.

Sugars are another kind of product into which sun-energy cooks the ingredients which plants draw from the air and from the earth. We get our cane sugar from the watery juice of the sugar cane. From this we drive out the water until we have the only perfect unmixed fuel food, our white sugar. Test sugar by the food thermometer and it will get a very high mark. Fruit-plants store energy in the sugar which is packed around the seed of the fruit. If fruits did not have so much water in them they would rank higher as fuel foods. Dried fruits, such as prunes, figs, and raisins, go high on the list for their sugar fuel.

Stored plant-food is not the only human fuel. It is the most abundant and the least expensive, but except in the case of our prepared table sugar it is not the most concentrated fuel. "Fats are fuel for fighters," said the government war poster which was displayed all over the country in the autumn and winter of 1917. We get our fats from animal foods—bacon, meat, cheese, cream, milk, butter, and lard—and from a few vegetable foods—olive oil, coconut oil, corn oils, and cottonseed oils. Animals eat plants and get the fuel-energy which is stored in this food. Then they, in their turn, store it. You remember that they chose to

spend most of the energy the sun gave them in movement, but to save some as a reserve. This reserve they store in fats and oils. Weight for weight, fats have more than twice as much fuel value as sugars and starches. That was why Uncle Sam wanted fats for his "fighters." Fats took less than half the room that the other fuel foods would have taken and space was precious on government ships.

The way to recognize a fuel food when you have no list at hand is to think whether before you bought it as a food it was stored by its plant or animal as a reserve. If it was, you will get the benefit of the energy stored in it. When you eat honey you are eating the sugar which the bees put away in the comb as we might put money in the bank. Because they store it so fast they can spare some of it for us and still be well provided for winter.

The way to buy fuel food is to get some of the less expensive energy-foods, such as potatoes and cereals and milk, and some of the more expensive, such as meats and fats. Always when you eat bread and butter you are laying in "coal" for your "furnaces."

The way to keep your furnaces from getting choked is to see that you do not eat too much fuel food, which would be almost as bad as too little. The danger of too much sugar or too much candy is that if it is piled on foods or shoveled in after foods which are already rich in fuel, it may so choke the furnaces as to keep them from burning well. To overload a furnace so

that it cannot burn well is to waste fuel and decrease the resulting heat-energy which a reasonable supply of fuel would give.

QUESTIONS

How many calories of heat do you use in a day?

What is the fuel which gives this heat?

How does Nature put heat-energy into food?

What do plants do with their energy?

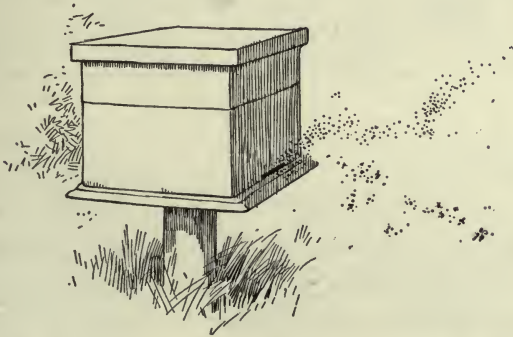
What do animals do with their energy?

Where shall we find stored energy-food in plants? Where in animals?

How shall we recognize fuel food?

How shall we buy fuel food?

Why should we be careful not to eat too much fuel food?



FATS

EGGS	OIL	LARD	CREAM	PEANUTS
NUTS	OLEOMARGARINE	BUTTER	CHEESE	

These foods, grouped in the picture at the top of the opposite page, are rich in fat, as are also bacon, fat meat, chocolate, and many cooked foods. As bread is spread with butter, many foods are cooked with fat to make them more appetizing.

SUGARS

SIRUP	APPLES	SUGAR	ORANGES
MOLASSES	BANANA	HONEY	PRUNES RAISINS

A large orange may contain two tablespoonfuls of sugar. Look at the foods grouped in the picture and see how many sources of sweets there are in our diet. Fresh fruits and dried fruits contain a generous amount of sugar combined with other substances which make for health.

STARCHES

BREAD	POTATOES	MACARONI
OATMEAL	RICE	GRAHAM FLOUR
HOMINY CORN MEAL	WHITE FLOUR	SHREDDED WHEAT

Bread and the many other cereal foods suggested by the contents of these plates make up an important part of our food. They give bulk; they supply fuel; they are easy to obtain and not expensive; they are plain foods without much flavor. We can eat them without tiring of them.



CHAPTER VI

OUR DAILY BREAD

When in the prayer we use the words "Give us this day our daily bread," we are asking for just what we need and all we can take. Man lives on a daily-ration plan. Our bodies are so built that they can take care of and use during one day the food for that day. This amount they can handle well; from it they can get good results. More than a day's ration taken in a day overcrowds our bodies. They can store a little, but the rest goes to waste.

Man's life must be run on the daily-ration plan because he is so free in spending his energy in movement and activity. Physically he is at the head of the Animal Kingdom, and animals belong to the adventurous group which chose to spend energy rather than to store it. It is a glorious group! Every one of us would make the same choice if we had to make it to-day. The need of providing three good meals a day is a small price to pay for the freedom of movement which we enjoy. Man does not even store up enough energy to take a long winter sleep, as some of the animals do. He is willing to put food into his "bank account" every day if by so doing he may be able to draw on that account freely.

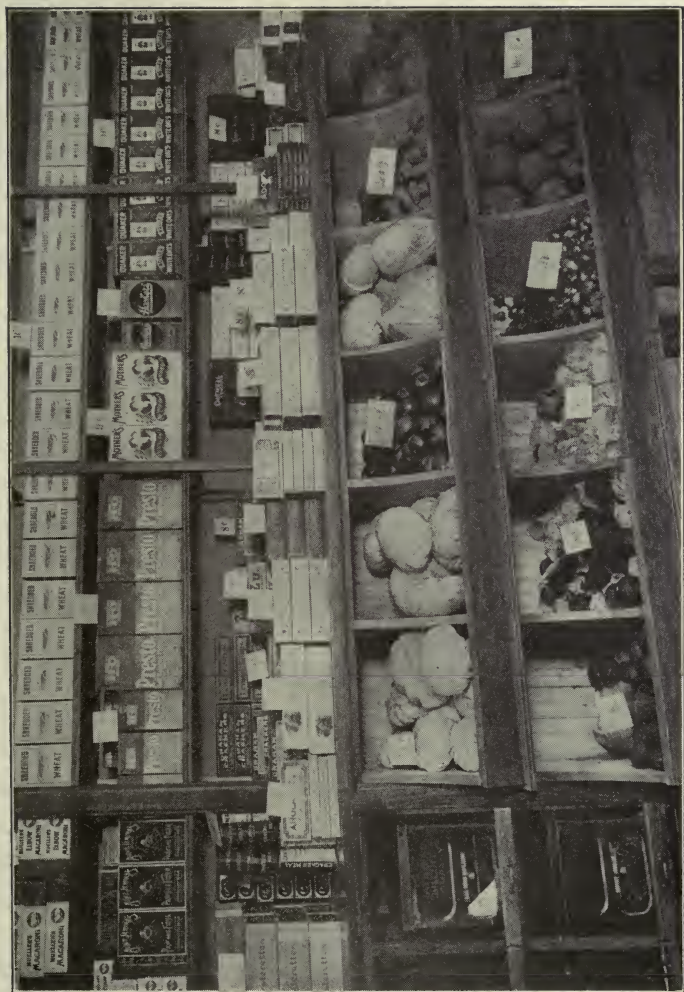
We have seen how closely the fuel intake and the energy output balance. They do not balance exactly. Prudently taking thought for the morrow, the Body Self does try to store up a tiny reserve which shows itself to us in the form of extra weight and bulk. We differ in the amount of reserve stored in our bodies. A little fat is a good thing. It allows us to draw on the body bank in sudden emergencies without danger to our health. The body must have food to keep itself going. If for some reason we do not give it this food, it will turn cannibal and eat itself, burning itself up to keep the fires going. Sometimes a man tries to see how long he can go without food. He may be able to fast forty days, but to fast for that length of time he must give up the privilege of moving about freely and using up his energy. He must also be willing to come out at the end of the time with a poor, weakened body, for in denying it food he has forced his body to live on itself. Only on the daily-ration plan can we enjoy our usual active lives.

On the daily-ration plan a man needs foods which fall into two groups,—fuel foods, of which we have been speaking, and life foods, of which we are going to speak. Fuel foods he needs because his body is a machine, taking in fuel and giving out energy. Life foods he needs because his body is a living machine.

All the fuel in the world will do no good if the furnace or engine is out of order or unequal to the demands on it. If the body were only a machine, and

not a living machine, you would never have grown an inch beyond the size you were as a baby in your mother's arms. You could not get much energy out of a machine of that size. But you would not have lived very long, or if you had lived you would have spent much of your time in some sort of repair shop. In Chapter IV you read about the heat-energy the body had to produce daily. The wear and tear on the parts of a machine working at such a tremendous rate is more than iron or steel could ever stand. Your body can stand it because it is a living machine. Because your body is alive, it can build itself, so that you grow from a baby to a full-sized man or woman. Because it is alive, it is its own repair shop. It can renew itself when parts wear out, as they constantly do. It can repair itself when parts need repair. It can oil itself and keep itself running smoothly, so that all the parts work silently and well together, without creaking or squeaking or rubbing as the parts of an engine would if they were not oiled. But like any other builder, it cannot build unless it has something to build with. It must have materials. It must have what we are choosing to call "life foods." We might almost have called them "body foods," for they are the foods out of which the body builds and rebuilds itself. They are the foods which do not burn up in the body, but which stay and finally become part of the body itself.

When Nature is preparing foods she does not put them up in neat packages, as breakfast foods are put



A GROUP OF FUEL FOODS

American Museum of Natural History, New York

up, sealing them and labeling them "Fuel Food," "Life Food No. 1," "Life Food No. 2," etc. Nature is not running a grocery store or even a medicine counter. She is running a food shop, and like a good cook she mixes all the needed kinds of material into appetizing dishes. Into some she puts more fuel foods: that is when food is being stored away by the plant or animal. Into others she puts more life foods: that is in the parts of plants or animals where there is the most life and growth. The way to be sure to get a good daily ration of both fuel foods and life foods is to eat a good varied diet. Some dishes will furnish more of one kind and others more of another; all together, if the meals are well planned, they will give to the body not only what will supply energy but what will also keep the machine at its best.

Preparing foods for eating is a matter of putting different elements together. Eating foods is a matter of taking them apart. Nature and man mix them. The minute they get inside the mouth the taking apart process begins. In the mouth the food is turned, as far as possible, into a liquid. Even here there is a little agent that is looking out for a special kind of food. This food it takes apart, splitting it up into less complex elements. In the stomach and all through the digestive tract there are more agents, each looking for its own kinds of food. They are stationed at intervals, like watchmen, so that if any life food gets by one which ought to split it up, it will have to pass another

and still another. The end and aim of all this splitting apart of foods is that they shall go to the cells in a form in which they can be used. A tiny cell could not use the mixture of fuel and life foods in a piece of bread as we take it into the mouth. When these foods have been split up into the simple parts or groups, the resulting liquid can be taken by the cell and burned as fuel or used as building material.

Just as a cook makes a great many dishes out of a few things like flour and eggs and butter, so Nature makes everything in the world out of a very few elements. For living plants and animals she has four main elements of which she uses considerable portions, and a dozen or more other elements of which she uses a bit here and there. When each food has been split up in the digestive tract, it has furnished the amount of each element that was in it. What the body needs for fuel it will burn. It will burn more than is desirable of the incoming life foods if it is running short of fuel. If there is a little extra fuel it may store part of it. What it needs of building materials it will either use at once or dispose of as waste. Fuel materials it can store; most of the life foods cannot be stored for more than a single day. They must be new every morning and fresh every evening.

As fuel foods are heavy and bulky to carry around with us, we shall be more comfortable if we eat of fuel foods only about the daily ration of the body. (Therefore, not too many sweets!) As life foods are very

expensive, and it takes a certain amount of energy for the body to get any excess of them out of the system after we have put them in, it will pay us to find out just about what our daily ration is and neither over-eat nor under-eat. (Certainly, not too much meat!) Then and then only shall we be running our food business well on the daily-ration plan which is marked out for us by Nature.

QUESTIONS

What in man's way of living puts him on the daily-ration plan?

If you were asked to choose to-day, would you choose to pay this price for your freedom?

What can the body do for itself because it is a living machine?

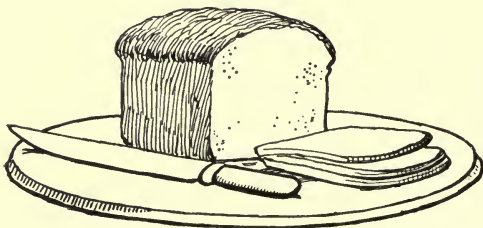
What kinds of food must it have to keep in running order?

Why should we eat a varied and balanced diet?

What happens to our food as soon as we have eaten it?

Why should we not eat too much candy?

Why should we avoid too much meat?



CHAPTER VII

THE MAGIC TOUCH

If, instead of mixing and baking a cake, your mothers put out on the table exactly the ingredients which go to the making of that cake, you would not want to eat them. Yet there would be just as much food value in the cup of flour and the eggs and the milk and butter and other ingredients as there will be in the cake when it is made.

If Nature spread out before you the elements of which she makes foods,—carbon, oxygen, nitrogen, and hydrogen, iron, phosphorus, sulphur, and the rest,—they would not do you any good so far as eating is concerned. Yet they would all be there, as all the materials for the cake were on the table before you. Plants could take them and eat them. That is what plants can do that animals cannot do. They reach out in the air for some elements and down into the ground for others, and finding them in combinations take them and make use of them.

We have seen how heat is as necessary for Nature's foods as for the dishes we prepare from them for the table; but even cooking is not all that is needed to turn elements—gases and minerals—into the products we eat as foods. They must receive the magic

touch of life. Till they have had that they are common elements; when they have had it they are fit foods for a living body. Everything we eat (excepting always the water we drink) has passed once, twice, sometimes thrice under this magic touch.

Wise men have searched in vain for that within a living body which gives it its life. When I was a child I had for a plaything a Japanese wooden egg which came apart in the middle. When the colorless outer shell was opened, there lay inside it a smaller egg gayly striped in reds and blues. That too would open. Inside it was another, and another, and still another, until within the tenth shell there lay a tiny egg that would not open. Searching within a living body for that which keeps it alive is very much like opening my play-nest of eggs. We may strip off one layer after another, peering intently into each to find the life in it. Each time there is a smaller living body within. Finally we come to the last, the tiniest of all. This is a living cell filled with a thick liquid. Here we are halted. We may look at this cell with our strong glasses; we may test it to see what it is made of; but we cannot find out how it differs from the cell which we could put together from the same materials. Only we know that in some way it has received the magic touch of life, which has turned it from a mixture of gases and minerals into a living cell.

This much we do find in our search for life, that wherever life is, whether in plant or animal, there is to

be found the same kind of fluid. This fluid is evidently Nature's life mixture. It is this fluid that receives the magic touch. When we find it we are next to life. Since the body is made up of cells full of this fluid, and the body is rebuilding itself, the best we can do in the way of supplying it with life foods is to give it foods which have a great deal of this life-stuff. All foods which have been alive have a little of this mixture. The nearer we come to the living part of a plant or animal, the richer the food is in this life-stuff.

There is no need for you to learn the lists of these life foods. It will be time enough for that when you are studying physiology, which tells you more about how the body works, or domestic science, which tells you about the foods you are cooking and what they do. Here we will group the life foods for you, so that you will know what they are when you see them referred to in food lists and in other books.

Meat and fish and living parts of vegetables we eat chiefly for the mixture of chemicals which make up that thick fluid we have just spoken of, which is always found next to life. All tissue that has been very much alive has it. Every seed has a tiny layer or shell of it, like the egg of the play-nest which was next to the innermost egg, that would not open. This, which is the chief class of life foods, is called the *protein* group of foods. In this class are placed all the parts of the food that go to make up this actual life-stuff.

When I tell you where the word *protein* came from, you will see why these foods are called by this name. Greek and Latin are the languages of science. That is because they are the old languages, which the scientist, whether he speaks English or French or German or Italian or Swedish or any other modern language, knows. So that is where we get our science names. *Calorimeter* came from the Latin word for heat, you remember, as *thermometer* came from the Greek word for heat. *Protos* is the Greek word for "first." So the fluid that comes next to life itself the scientist called *protoplasm*, or "first form," and the group of chemicals which together make up that protoplasm he named *proteins*, or "first things." When you hear people talking about "proteins," or about how much "protein" a food has in it, you will remember that all they mean is "first foods," — foods which come right next to life, made up of that stuff to which Nature gives the magic touch of life.

Proteins are not all alike. Nature does not make all her living creation on one pattern or by one recipe. "All flesh is not the same flesh," reads a verse in the Bible; "but there is one kind of flesh of men, another of beasts, another of fishes, and another of birds." The list might go on indefinitely, with the flesh of green leaves, and of plant seeds, and of milk, and of eggs, and so forth. All these proteins are good for us; all do some special work in our bodies. The way to get enough of protein, and enough of all the proteins you

need, is to eat a good variety of meat and fish and vegetables, with milk and eggs.

Because meat has been so lately living flesh, people used to think that to get protein into our bodies we must eat a great deal of meat. Now they know that there is

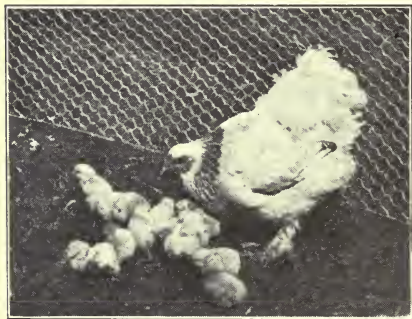


THE DAIRY COW

The best food producer in the world

protein in all life tissues. Milk must have a great deal of it, for from the mother's milk the calf must get its life-building food to make its body machine grow and to renew and repair its tissues. The cow eats a great deal of plant life, every living tissue of which has proteins. These her body works over and gives out in milk, which is therefore a good life food. Eggs must have a

great deal of it, else how could the tiny bit of life in the center of the egg grow and become a little chick? Eggs have fuel food stored in them, too, else how could the growing chick have energy to break its way out of the shell? Milk and eggs are the best all-round foods, because in them are stored all that the young animal needs for the first few days or weeks of its life. When we eat them we are getting the benefit of carefully prepared life foods.



Two other life foods have been lately recognized by the scientists which they do not even know enough about to name, except to call them "life foods" or *vitamines*, from the Latin word *vita*, "life."

They too come in foods which have been actively alive—in the green leaves of vegetables, in milk, in butter, in the fat of living organs of animals, in fruits, and in meats. They are absent from the stored products of plant life, the stored fats, the closely packed sugars, the starch supplies of the cereals and grains. Without them our bodies do not grow or work properly.

Then there are the minerals. It does not occur to you when you drink milk that you are drinking calcium, or lime. Yet you are doing so, and that lime, like a good many other minerals you take in your food, is

very necessary for your living body machine. The mineral parts of your food — and all healthy diets must have them — act in a hundred ways to keep the body machine working smoothly, as grease and oil lubricate the parts of a machine, and also to build up living tissue. One mineral helps to build teeth. Every living cell must have certain of these minerals, such as phosphorus. So we may put them in the group of life foods, or body foods, which are needed because the body is a living machine.

As you learned to know fuel foods as foods which the plant or animal laid by as a reserve store, so you will know proteins and vitamins and minerals as the groups which are found in the most active and living parts of plants and animals. Knowing this, you know the main facts about the kinds of foods needed for your body. Without a cook-book or a food-book or a diet-list you can go straight to Nature's storehouse and choose for yourself wisely and well from the abundance of plant and animal foods which she has provided for you.

QUESTIONS

What can plants do in getting food that animals cannot?

What must happen to elements before animals can take them as food?

What do we always find next to life?

What are proteins?

How are milk and eggs good foods?

What two other kinds of life foods besides proteins do we need?

PROTEINS

CHEESE	PEAS	MILK	BEANS	PEANUTS	DRIED BEANS
		MEAT	FISH	EGGS	

The foods in this group, shown in the picture at the top of the opposite page, are rich in the different kinds of protein needed for body building. Notice that with the animal foods are placed peas, beans, and nuts, furnishing vegetable proteins.

VITAMINES

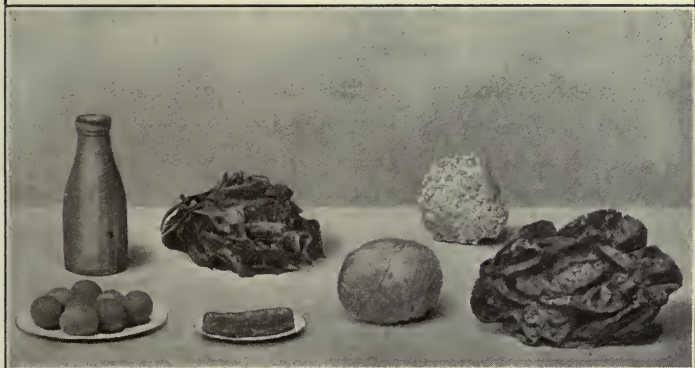
MILK	SPINACH	CAULIFLOWER	
EGGS	BUTTER	CABBAGE	LETTUCE

Milk, eggs, butter, and green vegetables are called by Dr. McCollum "protective foods" because if we eat them in reasonable quantity we get the needful amount of certain mysterious substances called "vitamines." Animals denied protective foods failed to grow and developed disease.

MINERALS AND WATER

MILK	SPINACH	BERRIES	APPLES	CABBAGE	LETTUCE
EGGS	BEETS	CARROTS	CUCUMBER	POTATOES	
		WHOLE WHEAT	CELERY		

Our bodies need water, which fruits and vegetables supply in good measure. They need mineral matter, contained in vegetables, milk, eggs, and in bread made from other than white flour. They need a good bulk of food upon which to work, and are provided with it by vegetables and fruits.



IN BUSINESS

To run the body part of the Food Business well, we must

Remember

- That the body is a machine,
taking in food as fuel,
burning it as it meets oxygen from the air,
and giving out energy ;
- That as we require from the body energy,
so we must give the body fuel ;
- That fuel foods are the foods in which heat-energy
has been stored by plants and animals as a
reserve ;
- That the body is a living machine,
building, rebuilding, repairing, and running
itself ;
- That for its life processes it must have life foods,
which are proteins, vitamins, and mineral
substances ;
- That we live on a daily-ration plan
and must therefore supply the body a diet of
fuel foods and life foods daily.

CHAPTER VIII

LIKES AND DISLIKES

To get the best out of our food we must enjoy it. That is common sense, and it is the best science too.

We might have been so made that we could get the proper amount of nourishment into our bodies without ever having the pleasure of tasting it. Instead, we who stand at the top of the scale of animal life have been given a very delicate sense of taste. Set in the lining of the mouth and on the tongue are little "taste buds," tiny cells with hairy endings, so folded in flesh that they look like the closed buds of a plant. Through these buds is brought to us the sense of the taste of the food we eat. Take them and our sense of smell away, and the business of feeding ourselves would be like putting food into the cup of a meat chopper.

Sometimes people have diseases of the mouth and throat so that they cannot take food in the usual way. They have to be fed through a tube, which pours liquid food into the stomach without its ever touching the inside of the mouth. We might think that so long as the necessary food reached the stomach for distribution through the body, one way of getting it in would do as well as another. As a matter of fact, this way,

which leaves the mouth out of the process of digestion, does not do at all. People may live through an illness with this method of feeding. But to get the best from their food they must take it through the mouth; they must let the little taste buds feel it and send a message of pleasure up along the nerves to the brain, with an accompanying signal to the stomach to prepare for it; they must let the mouth contribute its liquid saliva, and the little digestion agents in the mouth begin to tear the food apart. Then by the time the food reaches the stomach, the stomach is ready for it, ready to make the most of it. Putting food in through a tube is like pushing a person into the house without ringing the doorbell to summon the persons within to receive him. He may get in and he may stay in, but if they do not want him or are not prepared for him, he will not have so pleasant or so satisfying a time as he would otherwise.

It is a small thing the Body Self asks of us, that we protect and instruct it by this sense of taste. Taste is ready to be a very good servant, but it is often badly trained. A mistress is sometimes judged by the manners of her servants. Anyone who goes frequently into the homes of strangers comes to have a distinct impression of the lady of the house long before, summoned by her maid, she has arrived in the reception room to greet the newcomer. Sometimes a maid opens the door only a few inches, admitting the stranger as if only under protest; sometimes she escorts him in

and disappears in search of her mistress without taking his name or showing any more interest in his arrival than as if she were a piece of machinery set to open the door in response to a ring at the bell.

Nature begins the training of our servant, taste; it is for us to continue that training. We find taste very convenient and necessary as the watchdog type of servant, opening the door hesitatingly to suspicious-looking or suspicious-smelling foods which may contain poisons. We should not like to have it become a careless servant, admitting anyone without a moment's thought or inquiry. We must take pains, however, to train it to be a pleasant and welcoming servant for all kinds of good foods, discriminating carefully between them and giving to each an individual greeting.

A great many people do not have their food door opened cheerfully. They grumble over their food. They eat it when they are so tired that nothing would please them. They bolt it down so fast that they do not stop to think what it is or what it tastes like. Then they blame their bodies for not being ready or able to take care of it promptly and easily. Really the fault is all their own.

Along with hunger, which is the call of the body for food and is probably connected with actual contractions of the stomach, comes appetite, which is closely connected with taste and smell and the pleasant remembrance or anticipation of food. Hunger, like thirst, seems to be general. We hunger for food as

we thirst for water. Appetite is more discriminating, more closely related to our thoughts and feelings. The two work so constantly and closely together that we need not try to separate them, except to make more emphatic in our minds the importance of the pleasure element in the taking of food.

There has long been a remark in common speech concerning an attractive food, "It makes my mouth water." This remark describes an important physical fact. The sight and smell of food for which we feel a desire does make the mouth water and the saliva flow. It also makes the stomach "water," preparing, as we have said, at the signal sent by taste or smell, for the reception of the food. It is equally true that any strong feeling of distaste, of anger, of weariness, of fear, or of pain stops the mouth and the stomach from "watering" and keeps the food taken into the body from passing in proper fashion on its way. The Body Self does not run the food business independently; it is very dependent on you.

A dog, the pet of a great student of food, had what was like a window in his stomach, so that the flow of the digestion fluids could be watched. When he was hungry and was shown food that he liked, the juices would begin to flow at once in his stomach, before he had taken a single mouthful. Once a cat was brought into the room. The dog watched it with great excitement and anger. When the cat was taken away, although the dog went back to the food, the juices

did not begin to flow again for some time. His excitement and anger were so strong that they had ruled out and ruled over the food desires which would make for good digestion.

Again and again it has been proved with animals and children and men and women that for food to do



U. S. Official

A CORDIAL WELCOME

us the most good we must enjoy it. It is not enough to provide for our Body Self the right amount of fuel foods and life foods; we must speak a good word for them to the Body Self, welcoming them cordially as they come to us.

There are two ways to go about this very necessary matter of enjoying our food. One is to eat what we

like; the other is to like what we eat. These two statements may sound as if they were one and the same thing; sometimes they are, but only to the person who has a well-trained taste servant. The body must have a certain amount of fuel food; it must have a good variety of life foods. Suppose the taste servant lets in gladly only a few kinds of food. Suppose a person said: "I know that to have my food do me good I must enjoy it. Therefore I am going to eat what I like." With that thought he might go to a table set with a good mixture of fuel and life foods and he might say, "Now which of these foods do I like?" If he had a well-trained servant in his tastes and appetites, he would eat a little of everything and his body needs would be well met. If he picked all fuel foods and few life foods, so that the body had nothing to build with, or on the other hand all life foods, so that the body must burn them instead of building with them, he might have eaten what he liked, but he would have been a very poor business manager for his food business. He would be abusing his Body Self because he had never taken the trouble to train his taste.

Now a healthy person with a well-trained taste servant comes to the same table. He may know a good deal about fuel foods and life foods. More likely he does not. He knows that food is good and that he is hungry. He takes a portion of everything; he tastes it with interest; he eats it with enjoyment. Ask him if he likes what he is eating and he will assure you

that he does. He likes it because it is good; he likes it also because he intends to like it. When you take food or exercise or anything else in that spirit, it does you good. Of that person we might say, in the familiar phrase, "His food will agree with him." Perhaps we might better turn the words about and say, "He agrees with his food; therefore it will agree with him."

Nature starts us with a healthy liking for the foods which our bodies need. It is we who make the trouble, saying, "I don't like this," or "I never tried that; I don't think I should like it." Only a person who likes almost everything can safely let himself eat only what he likes. He has a well-trained servant in his tastes.

QUESTIONS

What part do our mouths have in the business of eating?

In what spirit should we have our food door opened?

Why must we enjoy our food?

How can we train ourselves to enjoy our food?



CHAPTER IX

A WORLD APPETITE

Turkey, carp, and carrots, we hear,
Came into England all in one year.

Here, in an old English proverb, we have history written not in dates of kings and battles but in terms of food and drink. It is a very sensible and democratic way of writing history, one that will probably gain in favor and importance in the years to come. Certainly much of the history of the Great War through which we have been passing might be written in terms of food. In exactly what year it was that turkey and carp and carrots came to England we do not know, but it was about 1520, a year famous in the period of discovery and exploration.

We expect to find in our stores and markets food from all over the earth. We expect to sit down every day to a world table. Only when war upsets the shipping of the world's food products do we stop to think where each article of food on our tables comes from and how many people are concerned in bringing our sugar from the West Indies, our tea from China, our fruits from the southlands, and our spices from the islands of the sea. In the olden days, when sailing

vessels were venturing out on the first long voyages of discovery, kings and queens waited with interest to see what new foods their captains would bring home to them. The turkey of the proverb had been brought to England from Mexico. It is a fact recorded in history that turkey was eaten in France for the first time at the wedding of Charles the Ninth in 1571. Carp was a fresh-water fish which some Crusader brought back to Europe from Asia, breeding it with great care in the ponds of his castle grounds. It is interesting that the necessities of war have revived the eating of carp. Now—four hundred years after it was brought to England—government publications are urging English-speaking peoples to eat more carp. Carrots came from the gardens of Holland, and a better vegetable could not have been brought.



Sugar, which we found it so hard to do without in war time, came to England only in Shakespeare's day. It was brought from Venice and was a great luxury. No nation or generation in all the world's history has used sugar as we Americans are using it in the

twentieth century. People had to get their sweets out of the other foods where Nature has stored them.

Only in our own time has a world table been set; only in our time has it been interesting to cultivate a world appetite. People have always kept their bodies nourished on the foods that lay close about them. Nature has seen to it that every man who lived close to the soil could in his own country raise the necessary life foods and fuel foods. The Chinese had their rice for fuel, and the Irish their potatoes. Bread and fruits were staple articles of diet almost everywhere. The Eskimo gets his fat from whale blubber, the southerner his from olive oil. Both can make up their daily ration of 2500 calories for body needs. For variety and interest and attractiveness nothing so wonderful as our present group of foods brought from all parts of the world has ever been known.

A world appetite is one qualification for a good traveler. If you went to dine at the home of a Chinaman and he offered you rice from his own rice fields, it would not be polite to say, "No, I thank you." A good traveler follows in eating, as in other customs of living, the old rule "When in Rome, do as the Romans do." He finds it worth while to do this not only for politeness but also for his own comfort. A man who could eat nothing but the food he had always been accustomed to raise on his own farm would have a sorry time of it if he went on a trip around the world and inquired everywhere for food to which he was

accustomed. Stefansson is able to live beyond the reach of relief expeditions in the far North because he can eat the food which the tribes dwelling there eat, and can live as they live. He can live "off the country," as Cæsar's armies did.

It was Stefansson's willingness to eat the same kind of food they ate which made some of the most remote tribes which he visited feel safe with him. There was one tribe in the far, far North which had never been visited by a white man and knew nothing of our world. Toward it across the ice plains Stefansson and his two companions came, to be looked upon at first as spirits from another world, not as flesh-and-blood men. As the news of the coming of the strangers spread through the village, men, women, and children came out to meet them. The women of each family, writes Stefansson,¹ "were in more hurry to be presented than the men, for they must, they said, go right back to their houses to cook us something to eat." You have often seen your mothers slip away as quickly to prepare food for an unexpected guest who had come a long journey. The men of the village set about preparing a house for the strangers, but before it was done children came running to announce that their mothers had dinner ready.

Stefansson's own hostess was "motherly, kindly, and hospitable, like all her countrywomen. Her first questions were not of the land from which I came, but of

¹ From "My Life with the Eskimo." The Macmillan Company, 1913.

my footgear. Were n't my feet just a little damp, and might she not pull my boots off for me and dry them over the lamp? Would I not put on a pair of her husband's dry socks, and was there no little hole in my mittens or coat that she could mend for me? She had boiled some seal meat for me, but she had not boiled any fat, for she did not know whether I preferred the blubber boiled or raw. They always cut it in small pieces and ate it raw themselves; but the pot still hung over the lamp, and anything she put into it would be cooked in a moment. When I told her that my tastes quite coincided with theirs — as, in fact, they did — she was delighted. People were much alike, then, after all, though they came from a great distance. She would accordingly treat me exactly as if I were one of their own people come to visit them from afar."

It was a strange moment when this twentieth-century explorer met a woman who might for all that she knew of the great modern world have been living in the Stone Age. Its difficulties were smoothed away before they even appeared by the simple sharing of a meal together. "People were much alike, then, after all," she said as he ate her food, and she adopted this strange white man as one of her own people.

Some of us would not have met the test as well as Stefansson did. We would not have been so ready to enjoy seal meat and raw blubber. Our tastes would not have been so broad as his. His would not have been so broad if they had not been trained. That is

one thing that we all should do—train our tastes so that we may have not a local, narrow range of likes and dislikes in food but a world taste and a world appetite.

Boy Scouts, Girl Scouts, Camp Fire Girls, every group of boys and girls getting together for self-training, go through regular drills and tests to improve their sight and hearing. They train their hands so that their sense of touch may be more keen. By cold baths and vigorous exercise they train their skin to resist cold. Let us begin to train our tastes.

First make a list of the kinds of food you eat in a week, not forgetting to count all the seasoning and spices and flavoring in the different dishes. Then study up in your geography and ask your grocer, your market man, and your fruit dealer, if you do not know, where each of the foods comes from. See how many countries help to set your world table; then see how much of a world appetite you have. Explorers have had to



cultivate world appetites because they were going around the world. You will find it very much worth while to cultivate a world appetite, because the foods of the world are coming to you.

Then when you travel, your tastes will be already trained. No one is so independent at home or abroad as the man who eats everything and likes everything. He has stretched his food tether to encircle the globe.

QUESTIONS

How can it be said that we sit at a world table?

What does it mean to have a world appetite?

From what countries do the foods on your table come?



CHAPTER X

THE FIRST STEP

"To dine," it has been said, "was the first step up on the highway of civilization." This first step man took when he began to cook his food. He is the only living creature that can make a fire; so he is the only creature that can practice the arts of cookery. This he has always done, to a greater or less degree. There is hardly a record in history or tradition of a tribe so savage that it ate all its food raw. The myths of all nations, as soon as they have told how man was created, give an account of how man got fire. The witty Frenchman was not far amiss who called man a "cooking animal."

Fire was to early peoples so wonderful that it is always pictured as the property of the gods, given to man by them as a reward for service or, more often, stolen or snatched from them by man. You should re-read, or read for the first time if you do not know it, the classic Greek myth of Prometheus, the friend of mankind who suffered untold agony that man might have fire.

The Polynesians have a story which traces the desire for fire directly to the taste for cooked food. Maui, so the legend runs, was a guard between the upper world

where mortals lived and the lower world where dwelt the gods. Though Maui had been born in the underworld, he had never tasted cooked food. When his mother came to visit him as he paced back and forth between the two worlds, she never shared the food which he offered her but ate always from a basket which she brought with her. One day, while she slept, Maui peeped into her basket and tasted a bit of her food. It was far better than anything he had ever eaten. Maui knew that the dwellers in the underworld prepared their food with fire, which neither he nor any other mortal had ever been permitted to see. "If fire makes food as good as this," said Maui to himself, "I must have it." So one day he followed his mother secretly to the underworld, and after many adventures obtained from the Fire God the secret of making a fire. After that he cooked food for himself. Nor was Maui selfish with this wonderful secret which he had obtained at such risk. He gave of his cooked food to mortals, and finally even shared with them his wonderful secret of how to make fires over which to cook their own food.

Cooking is the preparation of food by applying heat. This heat may be applied in several ways. The simplest and most primitive was to hold the food directly over a fire. We still cook by this direct exposure when we *broil* meat or *toast* bread. *Roasting* was another method of cooking with heat which came directly from the coals. Although we speak of "roast lamb" or "roast beef," nowadays we almost never roast. The

name remains from the time when meat was really roasted, the time when it was cooked out of doors over huge fires or turned on a spit before the open fires in the deep fireplaces of our forefathers. What we to-day



A NEW ENGLAND FIREPLACE

call "roast beef" is really "*baked* beef," — beef cooked by dry heat in an oven. Ancient tribes baked both in the embers under their fires, as we bake potatoes in the hot ashes of a camp fire, and in holes in the ground lined with hot stones. They would wrap the food in leaves and lay it on the stones, closing the hole at the top to keep the heat in. We are following this ancient

way of baking when we heat the soapstones of a fireless cooker and place the food between them.

Toasting, broiling, roasting, and baking are all methods of cooking in a dry heat; water or any other liquid is introduced only to prevent burning and to add flavor, as in the case of *basting* (which is to say moistening) meat which is being baked. *Boiling*, *stewing*, and *steaming* make use of the heat obtained in the boiling of some liquid. To boil is to subject to the action of heat in a boiling liquid; to stew is to boil slowly or to cook in a little water at a temperature below boiling point; to steam is to cook in the steam which comes from water at or near the boiling point. Indian tribes living near hot springs used to bring their raw food and cook it in the steam that rose from the ground near the spring. One tribe of Indians in our own country were called Stone Boilers, because it was their custom to fit a water-tight skin into a hole in the ground, pour water into this skin, put in the meat to be cooked, and then drop in red-hot stones. The heat from the stones would start the water boiling and thus cook the meat. Sometimes the stomach of the animal of which the flesh was being cooked would be used to hold the water, for the stomach is a natural pot of a fairly strong kind.

Cooking in fat, which we call *frying*, must have come later than these other methods of cooking, for it required the use of a pan or griddle to keep the fat from dripping into the fire or oozing out into the water.



OUTDOOR COOKING AT A SUMMER CAMP

Cooking by direct exposure to heat over an open fire is wasteful because the heat spreads in every other direction as well as the one where is hung or laid the food to be cooked. Most of our cooking is done to-day either in an oven or in a pot or kettle, in something that receives the heat and holds it.

It is interesting that to-day many of the old processes of cooking, which were laid aside with the coming in of the modern cookstove, are being revived. We have spoken of the fireless cooker, which will hold the heat in a covered kettle and let the mixture within cook for hours after the start given it by a few moments of heat applied from the stove. Outdoor cooking is being revived; boy and girl campers are making use of ways of building outdoor ovens and tiny stone fireplaces which the Indians of five hundred years ago would recognize at once, should they return from their Happy Hunting Grounds to the woods and plains over which once they ranged.

Outdoor cooking, in your own backyard if the fire laws permit or on the camping trips of your family, your group of Boy or Girl Scouts or Camp Fire Girls, or any other club, is not only good fun; it is very much worth while. It is good to be independent. It is good to go away from the town or city, from the kitchen with its cookstove and its woodpile or coal hod into the open and there to draw on the storehouse of Nature for your supplies. It is good to match your wits against the conditions of wind and woods

and weather, your muscles against the difficulties of a scattered supply of necessities, and to come out the victor, with a palatable, well-cooked meal to your credit. You have gained in the effort not only food but power. You have taken a part in the romantic, adventurous struggle of man to win a living from the land on which he finds himself. You have taken with the first man the first step on the highway of upward progress.

QUESTIONS

What are the three methods of cooking by direct heat? Describe each of them.

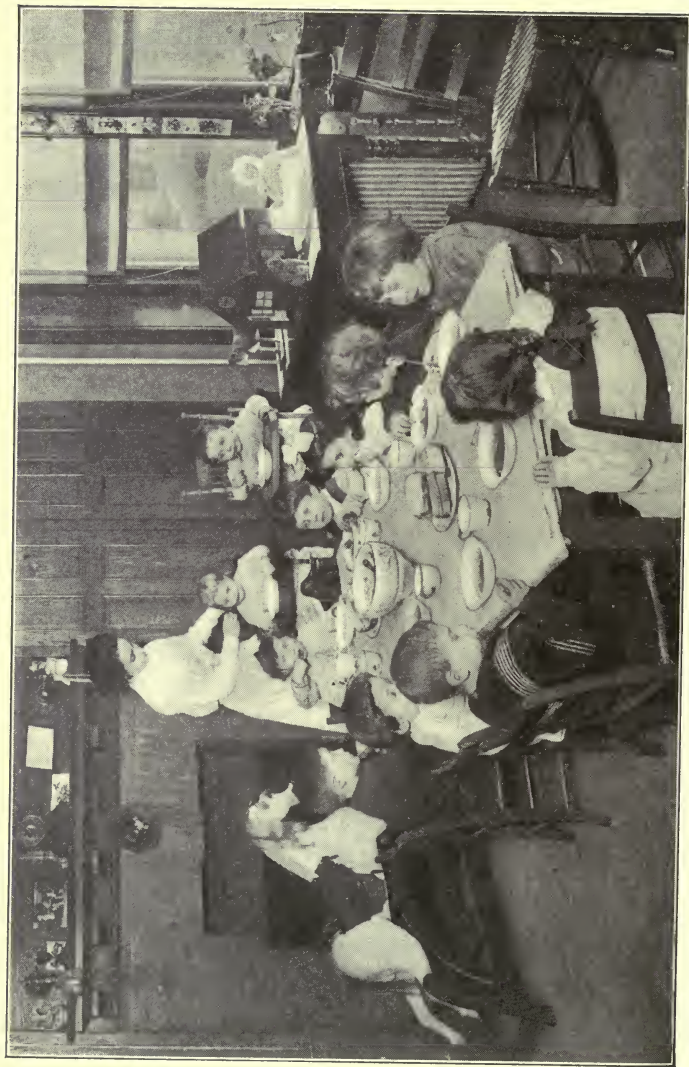
What is baking?

How do boiling, stewing, and steaming differ from these other methods?

What name do we give to cooking in fat?

How many of these ways of cooking have you practiced, indoors or out?





A HAPPY, HEALTHY GROUP IN A DAY NURSERY

CHAPTER XI

THE MOMENT OF EATING

If we did not enjoy eating, perhaps we should not be willing to take so much trouble to keep ourselves alive. Nature knew how that would be, so she did everything to make us enjoy the actual moment of eating. Man has responded by throwing around the moment of eating not only ceremony but a certain sacredness. To go through any form of eating together has been, among the simplest as well as the most cultured peoples, an act which carried with it obligations of friendship. The wanderer who had shared the food of an Arab host in a tent on the desert was from that moment under his host's protection. To the ancient Greeks no law was more sacred than the law of hospitality. When a man had partaken of food in the home of his host, a covenant had been formed between them.

A Persian nobleman was walking in his beautiful gardens when a man came rushing to him in great distress. He was fleeing from the crowd whose shouts could already be heard without the gates. The nobleman was at that instant eating a peach. To the fugitive he gave the remainder of the peach. When the crowd had forced their way into the nobleman's

presence, they told him that this man who had hidden himself from them in the garden had slain within an hour the only son of the nobleman. For this they were following him; for this they demanded that he be turned over to them for punishment. The nobleman hesitated but a moment. "We have eaten together," he said; "he must go in peace." Only when the murderer was beyond his host's protection could he be made to answer for his deed.

With us the moment of eating has been made the center of family and social life. On the physical side this is wise. That the old proverb "Good digestion waits on appetite" is true, we have seen from our study of digestion. Only when taste prepares the way do the mouth and stomach send out their digestion juices promptly.

It has long been suspected that smell has a great deal to do with pleasure in eating. Lately it has been possible to test this with three persons who had lost their sense of smell. Two of them were housekeepers, familiar with food in every stage of preparation. They would have had no idea, had these tests not been made, that their taste responses to food were so different from those of others. Yet when they were blindfolded and given different foods to taste and name, there were whole groups of foods which they found it almost if not quite impossible to identify. Butter, cream, and olive oil they could hardly tell apart. They could give no names to vanilla extracts, pineapple

sirup, bananas, grapes, quinces, strawberries. Tea and chocolate, which each took frequently, they could not name without sight or smell. Sour milk they did not recognize, nor did they reject kerosene when it was offered to them. Housekeepers of similar experience but with the normal sense of smell were able blindfolded to name these same foods without difficulty.

Smell, as taste's silent partner, is evidently far more important than we have supposed. Thinking back, we can prove this to ourselves by remembering how tasteless food is when we have a cold in the head which interferes with the keenness of our sense of smell. Taste and smell, with sight for a much less active partner, are the senses for whose examination the cook must prepare food. Taste and smell have always been put low in the scale of the senses, yet for bodily welfare and for actual pleasure they must be reckoned high. Sight and hearing have to do with what is outside the body; taste and smell have to do with what is entering the body. A man may see horrible sights and live; he may hear most distressing sounds and live; but he cannot take poison and live. Because it is so necessary for our well-being, it is said that the sense of taste is at birth the best developed of our senses.

All this new appreciation of taste and smell in its relation to food and bodily welfare gives us a new standard by which to rate the skill of the cook. We hold in esteem, says Hollingworth, "the workman whose craft consists in the preparation and arrangement

of sights and sounds in pleasing elements, orders, and compositions." He is an artist. "The workman whose craft consists in the preparation and presentation of acceptable sensations of taste, smell, touch, and temperature"—the cook, is not he or she an artist, too? Cookery is the oldest science in the world. It has been honored by kings and practiced by men and women of high skill. The cookbooks of the Middle Ages were written almost entirely by men, usually by doctors, for medicine and cookery have always been recognized as sciences which went hand in hand. "I do not consider myself as hazarding anything," said Dr. Lister, physician to Queen Anne and writer of a very good cookbook, "when I say that no man can be a good physician who has not a competent knowledge of cookery."

It is in recognition of the pleasure and importance of eating that man has made it the center of so much that is spiritual as well as physical. It takes weeks, months, even years, for our food to grow. It takes hours and days to prepare it, through the various stages, for its appearance on the table. It takes fifteen or twenty or thirty minutes to eat it. Of any actual mouthful we are conscious only a minute or two. That moment should be very satisfying to make all the preparation worth while. Let us think what we do or may do to make it so.

We eat at regular times. This is good for our bodily welfare, as the body adapts itself easily to taking small amounts of food at appointed times. Go past your

regular mealtime and the body reacts unfavorably, with discomfort of one sort or another. It is bad, too, to be eating all the time, as it gives no chance for the rests which are good for every part of our body machinery. It is better, too, not to overload the body with all the food at one meal, though this custom of frequent meals was not followed in many periods of which we have historic record. Plato, the Greek philosopher, was much surprised when, traveling in Italy, he noticed that the inhabitants ate twice a day instead of once, as was his native custom.

We eat in groups. Tasting is not a social act. Taste and smell require nearness to or actual contact with the object to be smelled or tasted. This may be one reason why they have been regarded as lower sensés. Twenty persons may look at the same picture at one and the same moment, sharing in the reactions it causes in them. Only one person may taste a given bit of food. Convenience and the social instinct have supplemented taste in this respect, making eating one of the chief social functions of life. It is much easier to cook food in quantity than to prepare single portions. It is better for one skilled person to do it over a single fire than for each person to prepare his own food over his own little heater. So we have food cooked in bulk and ready for eating at a certain time. Even this does not necessarily mean that we shall eat it together. Missionaries and teachers of backward peoples always feel that they have won a victory when

they persuade a family to sit down at a table and eat together. In making social the moment of eating they have strengthened the ties of family life. Members of a South Pacific tribe living on the island of Tahiti were found, by the first white men who



BACK TO BACK

landed there, to gather at the hour for eating, place themselves at a distance of two or three yards apart, turn their backs on each other, and eat in utter silence. The old custom had been handed down to them from the days when each feared that his food might be stolen from him by his next neighbor.

We serve food attractively. We remember that smell and sight are taste's silent partners and we try

in every way to meet their requirements as well as those of taste. A banquet, a luncheon, a camping supper, a "club feed," are only incidentally nourishing. It is the social element and the festive and artistic element that give them their charm. We share the deep-rooted instinct of the ancient peoples, to whom eating together was the highest form of companionship.

Man approaches the spiritual through the physical. We greet one another by a cordial clasp of the hands. We express our friendship by satisfying together our bodily needs. Food has entered into the highest acts of religion. The Jewish Passover is one symbol, the Lord's Supper another. In the breaking of bread together Jesus and his disciples sealed their spiritual union. Not only do we dignify the moment of eating when we sit together about the family table; the more we make of family life at meal-times the more happy family life we shall have. The family table is the place for the sharing of family interests. Begin each meal with a word of thanks to the Father in heaven for the food which we are about to eat together, and we have made the circle complete.

QUESTIONS

What three senses have to do with our enjoyment of food?

Why do we find food to be without flavor when we have colds?

Why is it good for us to eat at regular times?

What do we gain by eating in groups?

CHAPTER XII

IN THE WORLD'S FOOD MARKET

Indian boys and girls did not know much about markets. Their food came to them directly, without being bought or sold. They saw their fathers go out on the hunt to get meat. It was brought home, dressed, and prepared for eating. They saw their mothers plant corn and maize, harvest it, grind it, and make it into a kind of bread. Only when the work of the tribe was divided and parceled out was there need of a market or food exchange. When some were chosen for the hunt, and others who stayed at home must get meat from them, then for the first time there might be buying and selling.

The world's first markets were small and local. People of a neighborhood brought in their fruits and vegetables, their grains and meats, and shared by purchase or exchange in the products of their neighbors' farms. All the food displayed would come from within two, three, four, or five miles of the place of selling. When food was exchanged for other food, instead of money being passed, the transaction was called barter. All the early trade of the world was by barter. The people in one village had this year more wheat than

they needed; those in the next had more pork. Wheat was sent from the first village to the market of the second village, which in its turn sent back pork. So it went on, and the circle of food exchange grew larger and larger until to-day, as we have seen, we buy at our markets and eat at our tables food from all over the world. Instead of being little separate markets, the markets of each village, town, and city have become branches of the world's great Food Market. They are not independent of one another; they are like a chain of stores that encircles the globe.

If we had never thought of the world as buying at one great Food Market, we should have learned to do so during the war. The war taught us many lessons. The most important, which we shall remember longest, were those about the oneness of the whole world. We found that our village or town or city or even our nation did not and could not live unto itself. It was linked up closely with the rest of the world. One of the ways in which we felt this most quickly was in that great world's Food Business, into which, as you read in the first chapter of this book, we were all born as partners.

The world's Food Market carries on a huge business, Food is reckoned in tons and carloads and shiploads instead of in pounds and packages. If all the foods in this market could be spread out on counters which you could see, as it is actually spread out in millions of branch shops, there would be, in spite of the endless

variety of foods, also a great sameness. All the different names and kinds of vegetables and meats and breadstuffs and fruits would match up and fall into a few big groups. When they had been put into these groups, a few chief foods would stand out as the foods on which people everywhere depend. These take far more space on the counters of the world Food Market than any others or than many of the lesser foods put together.

Wheat, with its sisters and cousins, — rice, millet, rye, barley, corn, and maize, — holds chief place. The world raises more grains and cereals than any other food. It gets more nourishment out of them than out of any other food. It ships more of them from place to place. That is the reason why wheat was a subject of so much importance in the war. Kings and presidents and food administrations, ambassadors and peace conferences, — all had to give much time and thought to the problem of raising, carrying, and distributing wheat and the other cereals.

Sugar occupies an important place. In the year 1913, the year before the war, the sugar crop of the world was nearly twenty-one million tons. This was less than one fifth of the world's wheat crop; but the sugar was produced in fewer places than the cereals. Its circle of exchange was larger. So our sugar shortage was due, more than to any other one thing, to the lack of ships. When we had to go without cane sugar from the tropics, we looked about on the counters of the world's Food

Market and found many other nature sugars which grew nearer home. The beet-sugar industry was greatly helped. Corn sirups, honey, maple sirups, and the like were used as substitutes for sugar. We use sugar more for its flavor than as a food. A little of it will go a long way in flavor, and we can get our needed fuel in larger measure from other foods.



A WAR-TIME EXHIBIT OF SUGAR SUBSTITUTES

Beans occupy a great deal of space in the world's Food Market. The people who would be crowding to buy the largest amounts of them would be the people of India and other countries of the Far East. Our own country raised in the year before the war only about one tenth as many beans as India. Beans of one kind or another are found everywhere in the world, however, and a most satisfying and nourishing food they are.

European, British, and American peoples would be found crowding around the potato counter. It would

be a big section of the market and well loaded. A bushel of potatoes has nowhere near the food value, bulk for bulk, of a bushel of grain. So while potatoes take up a great deal of space and are popular, they are better to eat in the local market than to ship to distant places.

We Westerners would be surprised to see that meat does not take nearly so important a place in the markets of the world as it does in our own local markets. More than half the people of the earth eat very little meat. This is because in many parts of the world there is not room for the meat-producing animals — cattle and sheep and hogs. These animals must have land for grazing. When people come into a region and settle thickly, the meat-producing animals are crowded out. So the meat of the world is produced in only a few countries — Australia, New Zealand, the United States, Argentina, and Canada — and is eaten chiefly in those countries and in lands to which it is easily carried. Europe and the British Isles buy a good deal of meat.

The same animals are far more important to most of the world for the milk, butter, and cheese they produce when living than for the meat of their bodies. Milk is probably the most important food we have and is increasingly in demand, especially in the Western world. Because it is so important, we should all drink a good daily portion of it. Here we mention it only as having an important place in the list of mankind's chief foods.

Fish, vegetables, fruits, and nuts are to be found on the tables of local food markets. Japan eats a great deal of fish, as do many coast sections and islands. Every country has its own fruits and vegetables. Some of them enter into the trade between countries. But if we could see the world's Food Market as the world's foods are spread out on it, wheat and other cereals would take the most space; sugar would call itself to our notice at once; beans, potatoes, and meats would follow along; milk would stand out as very important. In each country these chief foods would be accompanied by local foods.

No boy or girl who lived through the war will find this list of chief foods hard to remember. The names of these appeared many times on war posters. When the war made it hard to ship food from one place to another, we tried to eat more of the local foods. Wheat we had to send abroad, because people there could not be raising it; so we cut down our wheat ration and ate local "substitutes," the sisters and cousins of wheat, which could not be shipped so easily but which would give us a good measure of fuel- and life-food elements. Corn, which is a native American food, came into its own during the war, giving us of its sweetness in corn sirups as well as its other nourishing elements as a cereal. Almost all the war substituting of foods was a coming back to our own local markets instead of sweeping so wide a circle in our exchange of foods. It had the other side too, that

we tried to send to empty food markets in suffering lands food from our local markets.

QUESTIONS

How did there come to be markets ?

What groups of foods hold chief places in the world's Food Market ?

Which foods are best in a local market ? Which are shipped from country to country ?



CHAPTER XIII

THE PITCHER AND THE LOAF

In the long-ago days when mysterious and powerful strangers sometimes walked the earth in disguise, it befell at nightfall that two travelers came to the humble cottage of an aged couple, old Philemon and his good wife Baucis. These strangers, who were humbly dressed, had been driven rudely out of the neighboring village, where they had sought food and shelter. Philemon and Baucis welcomed them cordially, for they were given to hospitality. However poor and scanty their fare, they were always more than glad to share it with the hungry stranger. So they set before these guests all that the house afforded, grieving only that their last loaf of bread was half eaten and their pitcher only partly filled with milk. But behold! as the strangers lifted again and again the pitcher, which a moment before they had emptied, it had in some mysterious way filled itself again, and as Baucis cut the bread, thinking that each slice would be the last, there was always another slice. The pitcher was become, through the wonder-working powers of the guests, a miraculous pitcher which would never be empty when Philemon or Baucis might need milk; the loaf was renewed to meet the needs of these guests.

With an enchanted pitcher and a self-renewing loaf no one need suffer for nourishing and palatable food. Bread and milk and bread and butter (made from milk) are the best all-round foods in the world. No one would want to live on them alone. Philemon and Baucis served their guests honey for sweets and grapes for fruits and added to their own noonday meal vegetables from their garden. But as a basis for the diet of everyone, and particularly of growing boys and girls, milk is the best all-round food, with bread as a close second. Put the two together and you have life foods and fuel foods in good measure.

Milk is the only kind of food that should never be left out of our diet. No matter what the price, we cannot afford to go without it. Milk is so important that every state has whole books of laws about it; every farmer who sells it is especially followed up by county and state officials. The reasons why we should every one of us take a quart if possible, but surely a pint of milk, a day are facts every boy and girl should know.

First, *milk comes nearest of any food to being a complete diet in itself*. Babies live on it; young animals live on it. It has fat in it and a milk sugar; it has two very desirable proteins, so that a considerable part of our needful protein life food can come from it; it has mineral elements in it, particularly a larger amount of calcium (lime) than any other food. Calcium makes and remakes our bones, and in other ways is

needed for good health. There is hardly any in meat or bread, none in fats and sugars, very little in most other foods; but in a quart of milk there is enough for a daily portion for a boy or girl, in a pint enough for a grown person. Milk and the butter made from it have also those two necessary items for growth and health, the vitamins, which we spoke of among our life foods. We sent all we could of food containing these vitamins to the starving children of Belgium, for it was found that these helped them to grow and to get and keep well. We had always had enough vitamins in our diet so that except in war times or cases of underfeeding we had not known how much they were needed. Milk has small amounts of other elements good for keeping the body running.

So, first, *milk should be taken for the large number of good and needful life foods and fuel foods in it.* It has in it almost everything needed for growth and body-building and body-running, though there are other things used in these processes which it does not supply. It is not a complete diet, but it comes nearer to being such than any other food.

Second, *the elements in milk are easily taken up by the human body.* The Body Self welcomes milk because its sugar can be easily put to use, its proteins easily turned into life-stuff.

Third, *milk is easy to cook with.* Used with other foods it makes appetizing dishes. Turn over the pages of a cookbook and see how many recipes use milk.

It is good for us and easy for the body to take up; it is also in a convenient form for us to use.

Fourth, *it fits in with other foods which we commonly eat and makes up for the elements which they lack*. If we drink or take in our cooked food a good amount of milk along with our other foods, we may feel quite sure we are running our body business well. If we do not take milk, we must take a good deal of trouble to attend to getting the right kinds of food.

Fifth, *it is economical—whatever its price*. A quart of milk is equal in fuel value to eight eggs or nine ounces of round steak. It has been calculated that milk at twenty-five cents a quart would be cheaper food than eggs or steak at average prices. Here is what four writers have said about it:

Milk is the cheapest form of animal food for the money that the householder can buy.—H. B. ENDICOTT, State and Federal Food Administrator

The greatest factor of safety in the human diet is the regular use of milk.—United States Food Administration

You can get more for your money in milk in actual food value, in energy, in protein, in repairing and building properties than in any other food in the world.—W. T. SEDGWICK, Professor of Biology in Massachusetts Institute of Technology

Milk is an indispensable article of the diet of any people who wish to achieve. . . . Without the continued use of milk . . . we cannot as a nation maintain the position as a world power to which we have risen. The keeping of dairy animals was the greatest factor in the history of the development of

man from a state of barbarism. . . . We are still dependent on the dairy industry for our continued prosperity.—
E. V. McCOLLUM, United States Nutrition Expert

No wonder states and cities and towns and homes look after their milk supply to see that it is clean and wholesome, for milk, more than almost any other food, suffers from being carelessly handled. In the care of milk from the moment of milking to the moment of eating there are three rules to be followed: *keep it clean; keep it cool; keep it covered*. Follow these three rules and your milk will do wonderful things for your body health.

As soon as we grow up from being babies we pass from having milk alone to having bread with it or bread by itself. Bread is truly, as the proverb says, "the staff of life." In the problem of feeding whole nations on the least amount of food possible, during the war, it was found that if the bread ration of a people was kept normal and sufficient a great deal of change and of cutting down might be practiced in the other foods of the diet without harm to the health or spirits of the people.

Bread has been eaten by all peoples, but to some of the queer foods that other peoples have called breads we should not give that name. They were alike in having been made from a kind of flour which was made from some cereal. Here their likeness to our whole-wheat bread or our white bread or our biscuits and rolls and muffins ended. We as a people have the

best bread in the world. We are likely to eat too much white bread and too little corn and graham and whole-wheat and other breads that have in them some food elements for body-building and body-running that white bread does not have. All breads give good bulk to our food and help the body to keep its waste



U. S. Official

IN AN ARMY BAKERY

materials moving. We should eat each day one or two slices of some bread besides white bread if we can.

When you have a chance, watch while bread is being made. Bread-making is carefully regulated by the government — in flour mills, where flour is made from the grains, and in public bakeries, where loaves of bread are sold. Bread-making is one of the most interesting operations of cooking and is worth looking into, until some day you learn to make bread yourself.

So long as we as a nation have a miraculous milk pitcher that never runs dry and a loaf of bread to eat

with our milk, we shall not suffer for good foods. It is for you to be sure that pitcher and loaf are given sufficient honor at your table.

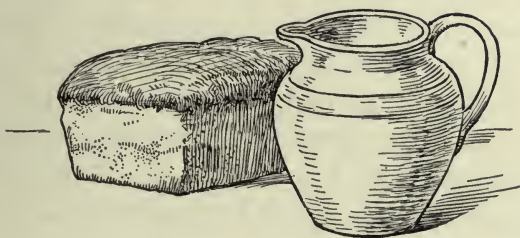
QUESTIONS

What do we mean when we say that milk is almost a complete diet?
(See charts, pp. 173 and 177.)

What are the five reasons for milk in our diet?

How much should every boy or girl take each day?

What part does bread have in our diet?



CHAPTER XIV

THE GIFT OF A GARDEN

A garden was God's first gift to man. When, according to the Creation story, he had formed man, the Lord God went eastward and planted a garden. There he put the man whom he had formed. "And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food." This garden man was to "dress" and "keep." Animals were not given a garden. They could not use one. Like man they eat plant food, but they must take it as they find it. The lion may be the King of Beasts, but he has no control of the land over which he stalks. To man was given dominion over the earth. The land is his, and he may use it as he will. The gift of a garden has been handed down from father to son, from generation to generation, for all the hundreds of years since.

You remember the fable of the old man who as he was dying told his sons that in the bit of land which he was leaving them lay buried treasure. One son laughed at the idea and after digging for a few hours and finding nothing went away to seek his fortune elsewhere. The other son stayed at home on the land the father had left them, and as he worked over it and

dug in it and tended the seeds which were planted in it he found in his garden both health and wealth. To him the land had given its hidden treasure.

They are old stories, but they are as true for you and me as on the day when they were first written. We too can have for the asking the gift of a garden, and there never was more need for the wealth that we shall find in it than there is just now. The saddest sight in France is No Man's Land, that region miles and miles wide which was once the fairest garden land in France and is now a barren waste, hideously plowed by shells and sown with the remains of warfare, so that it will be years and years before it can be made to bloom again. Yet old men and women and children are finding their way back to these desolate wastes, eager to spend their lives to make this once more the garden spot of France. We who take land and garden stuff as a matter of course, and even grumble a little over the work that must be done to plant the seeds and keep the rows of little plants free from weeds, may well think of this and be thankful for our gift. The worst waste lot in New York City from which Boy Scouts took wagonloads of tin cans and ashes last summer before they made it into a school garden would seem wealth to little French boys and girls compared to their own ruined land. Yet the French children are making battlefields into gardens as fast as ever they can. While these gardens of the war countries are in the

making, and in the many years before they can be what they were before the war, we must make the most of the land which we have and so help to raise food for those who have not our rich gift.

Uncle Sam found out during the war what his children can do in the way of food gardens. That is why he is piping for you all to follow him as he leads the way to the fields. "Let me suggest," said President Wilson, as he called the nation to arms and to service in April, 1917, "let me suggest that everyone who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations." The answer of the boys and girls to this call was splendid. Sixty thousand acres of land that had been lying idle was made into food gardens by a million and a half boys and girls. Now, when you have a garden you are joining an army, the United States School Garden Army. It is as big as the army Uncle Sam sent to France, and it is growing every day. When you have joined it you are not only cultivating your own little plot of land, you are an active partner with Uncle Sam in his share of the world's food business. Just at present Uncle Sam is taking a very large share of that business into his own hands in order to help out the hungry peoples who have been made land poor and food poor by the war. The sooner you sign up and get into the School Garden Army the better (on page 174 you can read how to do it).

FOLLOW THE PIED PIPER

Join the United States
School Garden-Army.



Having a garden takes you out of the ranks of those who only eat food and puts you in the ranks of those who raise food for eating as well as eating what other people have raised. The first question to ask yourself as a garden soldier is, What am I going to put into my garden? It goes back to another



GARDEN SOLDIERS

question, Who is going to eat what I grow in my garden? You and your family and your neighbors will eat what you grow in your garden. That may sound selfish and disappointing. You have been thinking that you will be ready to do the work of a garden if it is going to help feed hungry boys and girls on the other side of the world. Now you are told your garden is to feed yourself. Feeding yourself is the first thing for you to do as a garden soldier, for just

THE GIFT OF A GARDEN FOR

in so far as you feed yourself Uncle Sam will not have to feed you. He will have just so much more food of the kinds that can be packed and shipped to send overseas. Uncle Sam has about so much food that is raised every year in his food business. Part of it you eat; not very much, perhaps, but as there are several million boys and girls who eat each about the same amount, it counts up. Uncle Sam does not want you to eat less than you need, but if you can raise for your own table food that would not otherwise be raised and so draw less on his supply, you will be a very worth-while soldier and partner. Together the boys and girls of the United States can release a large amount of food to go overseas.

If you and your family are to eat the food from your garden, you must raise food that you will enjoy. You must think, too, how vegetables fit your body needs. Fruits and vegetables supply a great deal of water in the diet, and that is good. About two thirds of your whole body is water; the rest is solid. If you



weigh ninety pounds, sixty pounds of that weight is the water in every tissue of your body. As it rebuilds and runs itself, the body wants mixed in with its food a good supply of water; fruits and vegetables will give this. An apple is eighty-five parts water to fifteen parts solid, a strawberry ninety parts water to ten parts solid. Even the starchy potato has seventy-eight parts of water to twenty-two of life and fuel foods, while celery has ninety-four parts water to six of solid.

Fruits and vegetables give good bulk to our food, and that the body needs. If all our foods were liquid, like milk and water, or were closely packed, like medicine in tablets, they would not give the digestive tract enough material on which to work. The waste of the body would not be carried off so easily and regularly. Besides, we should not feel as if we had had a good meal. We want a good deal of something to eat. Fruits and vegetables make up that "something." If we have raised them in our own garden we are getting the needful bulk at a low price.

Vegetables are plant foods, and as such they vary as to whether they contain more stored fuel food, saved by the plant for future use, or more proteins and other life foods. As a matter of fact we depend on them for all these needs of our bodies. They give us mineral salts. Milk, you remember, had calcium (lime). So do our common vegetables. They give us also good proteins, the foods which are next to life itself

and so are needed for our living cells. The leaf vegetables give us in their green parts good supplies of the vitamins, without which we can neither live nor grow.

There is one other fact to remember about vegetables in general. They fit in well with milk and bread and butter to make up a good all-round diet. If we want to treat the Body Self well without taking much trouble to figure out how much of each kind of food we are giving it, we are perfectly safe when we have put into our daily ration a good mixture of milk, bread and butter, and vegetables, with a sprinkling of sugar and a variety of fruits.

Suppose all the common vegetables were to come and stand in a row before you and ask, one by one, for a place in your garden. If you had room you would like to welcome them all. Perhaps you can, but even then you must choose which ones shall have the most space. Here is what they might say for themselves:

POTATO. I have a good portion of fuel food stored up in me; I have a little protein of a kind that is very much needed and not very common; I have a good supply of vitamins; and I have a group of mineral salts without which you cannot be healthy.

BEANS. You must plant a good many of my family, one kind or another. We all have a good mixture of fuel and life foods and water. Besides, we grow fast and do not need much care.

TOMATOES. We are easy to raise, too, and though we are mostly water, we have a good acid flavor, we have some mineral salts, and we look well and taste good on the table with

meat and potato and bread and butter and some of those other plain foods.

LETTUCE. I help out a great deal at table. I may be made up mostly of water, but I have minerals, and I am one of the very best of those leafy vegetables without which no one can get along.

CABBAGE. So am I, and I have a lot of nourishment in me, too.

SPINACH. So am I, and I have some iron for you.

BEET. I give you fuel food and a sweet flavor as well. Much of the sugar of the world is beet sugar, which comes from such beets as you can grow in your garden. Why not plant me, tend me, eat me, and so get the sugar straight from me?

PEAS. I am good for sugar, too, and for all the things seeds give to the diet.

CARROTS. People do not pay much attention to me, but they would if they knew that I have a good supply of fuel stored up in me, ten times as much lime as a potato of the same weight, and a good bit of phosphorus. Really, I am a kind of all-round vegetable.

RADISHES, PARSNIPS, and TURNIPS. We are roots. We are very good to eat and very good for you.

You would have quite a garden if you listened to them all, would you not? Read the garden suggestions sent out by the government for your army, which you may obtain by writing to the Director of the United States School Garden Army, Washington, D. C., talk over your plans with your parents and teacher, and then choose which you will plant by three tests: (1) what you like, (2) what you can raise easily, (3) what will give you good food value.

QUESTIONS

In what way is the United States rich compared with other countries?

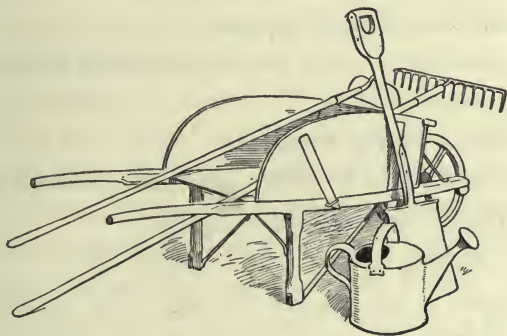
How does your having a garden help Uncle Sam in his Food Business?

What do fruit and vegetables do for the body?

What part do fruit and vegetables have in an all-round diet?

(See chart, p. 177.)

Which vegetables shall you cultivate in your garden?



OUR FOOD

To make the most of the food supply about us, we must

Remember

- To enjoy the food which we eat,
so that the body will welcome it ;
- To cultivate a world appetite,
so that we may get the benefit of sitting at a
world table ;
- To eat at regular times,
so that the body may work and rest alternately ;
- To dignify the moment of eating,
making it the center of family life ;
- To give to the pitcher of milk and the loaf of
bread a place of honor at our tables ;
- To welcome at our tables a variety of fruits and
vegetables, raising them in our own gardens
in so far as we can.

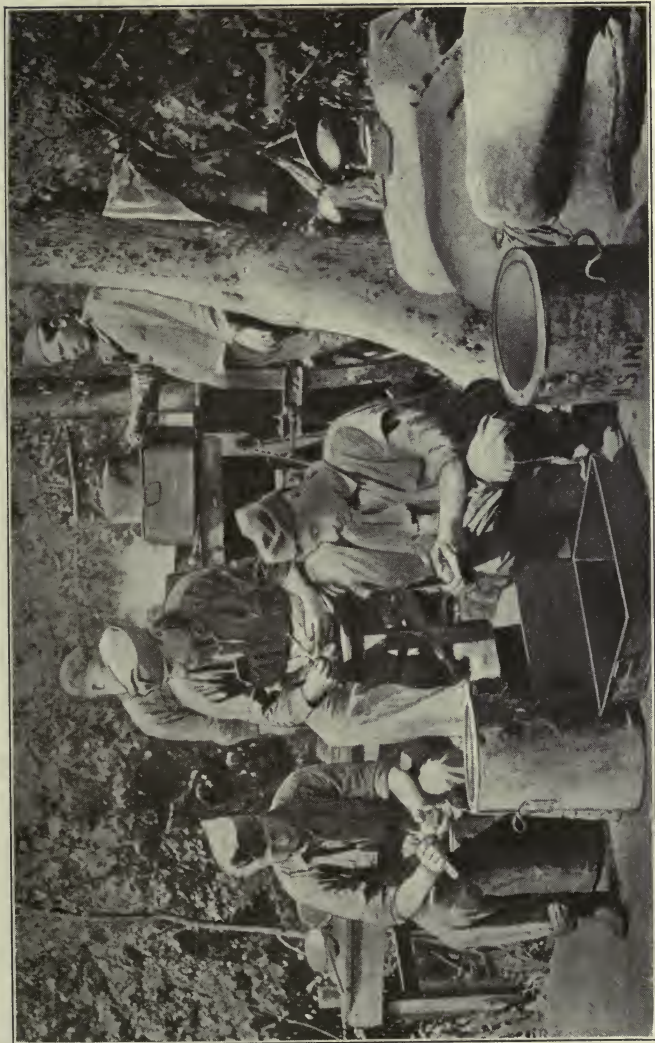
CHAPTER XV

KITCHEN SERVICE

Kitchen service is a service into which each one of us will at some time in our lives be drafted. Most of us will probably do a good deal of it, for we have not at our command the fairy spell which Little Two-Eyes had. The wise woman found her crying and taught her a spell which would keep her from ever being hungry again. She had only to say to her goat, "Little goat, bleat; little table, rise," and a neatly laid table would stand before her, with the most delicious food on it. When she was satisfied she had only to say, "Little goat, bleat; little table, away," and the table would disappear. When the wise woman had vanished, Little Two-Eyes tried the spell, and there before her was a little table covered with a white cloth, on which were laid a plate, a knife and fork, and a silver spoon. The most delicious food was there also, and smoking hot. "This is a beautiful, easy way of housekeeping," said Little Two-Eyes, and so it was. But it did not last even for Little Two-Eyes, for the prince came and took her to a beautiful home of her own. There she needed neither goat nor table, for she could have the happiness of keeping house for herself without any cross older sisters to take away her share of the food.

"I shall be a far better husband to some girl when I go home than I would have been if Uncle Sam had not drafted me," said a tall, handsome soldier, as he peeled potatoes by an army stove in France and talked to a visitor while he worked. "I think I've peeled a million of these since I came to France! And I thought I was coming over here to fight Germans!" Uncle Sam did not despise kitchen service when he came to the problem of feeding his boys in camps both here and overseas. He drafted into this branch of service every man who had had previous experience in cooking and urged all who showed any interest or talent to volunteer for training. Schools for army cooks were set up in many camps. Here men were given three months' instruction in cooking, at the end of which time those who had passed the examinations received diplomas and were assigned to be company cooks.

The cooks had to learn how to use their supplies. They had to take the ration list which was spoken of in Chapter II (see pages 10 and 164) and twist, turn, vary, and combine its ingredients so that the hard-working men would be well nourished. They had to see that the men had the right number of calories each day. A soldier was using up a great deal of energy. He must make up for it by a good supply of fuel food. Including unavoidable waste, the American soldier is said to have taken into his body on an average 3635 calories' worth of food



U. S. Official

AN ARMY KITCHEN IN FRANCE

daily, while his actual allowance was for nearly a thousand calories more. The prisoner of war had sent to him daily in the enemies' camps, through the agency of the Red Cross, by the advice of the surgeon general's food experts, a 2600-calorie ration.

If you think you have had to learn in this book a good deal about calories and proteins and vitamins and other food matters of which you had never heard, you may rest assured that it is "child's play" compared to what these boys who qualified as army cooks had to learn. On whether they knew these facts and could make the most of the ration given them, so that the men would eat it with relish, depended the health, the morale, and therefore the fighting power of the soldiers. It was a matter of winning the war or losing it. If any boy had ever failed to hold a good cook in honor before he went into the army or navy, he learned then and there his mistake. The cook came into his own as a person of importance.

But how the boys hated the monotony of the camp mess! How they longed for the home table and welcomed the doughnuts of the Salvation Army lassies or the cups of chocolate of the "Y" and Red Cross canteens! I doubt if there was a man in the army who did not write home about the food he was eating, about the special Thanksgiving dinner, or the treat he had when he was on leave. The letters I received were full of such allusions. If you have ever eaten at a restaurant or a boarding house for any length of time, you

will know why the boys felt as they did. Only a good home cook, preparing food for a small family and putting love and intelligence into the task, can set an inviting table day after day and week after week. Eating in platoons may be necessary in war times, but it is



U. S. Official

THE CAMP MESS

a dreary business to stand in line and march in to dinner with a thousand other men. "Better a dinner of herbs where love is," said the wise man in the Book of Proverbs, and thousands of home-coming boys echo his words.

If the home cook is to be so held in honor, she must have the knowledge which the army cook gained. She must have all his virtues and add to them the

charm of home cooking and home service. Girls and women are not the only home cooks. Even as Gareth took his turn at kitchen service when he went as a page in King Arthur's hall, so boys are taking their term of kitchen training, that they may be capable of providing for themselves in an emergency and so be independent all their lives. Of what good are the best kitchen or the choicest ingredients in the world if there is no cook to use them? Is a boy or man to condemn himself to raw food if there are no girls or women about? The army did not think so. The modern boy does not think so. Boy Scouts can go off on a camping trip and cook most excellent meals for themselves. They help their mothers with the heavy jobs of kitchen work at home and surprise her by turning cook when she is ill or absent. If we are to be masters of our own part of the food business, each one of us had better learn all that can be picked up at home or outside the home about cooking.

It takes a whole alphabet to go the rounds of some occupations. Cooking falls into C's. We begin with the *Cook*. To be a good cook one must be *clean* and keep everything about the preparation of food *clean*. "'T is by his cleanliness a cook must please," said old Dr. King in his "Art of Cookery," written more than two hundred years ago. We are still surer of this fact, for when he wrote no one dreamed of the germs and bacteria which are just waiting to do harm if things are not kept pure and clean. No one knew

how flies pick up dirt and disease on the cushioned balls of their feet and carry it to the next article of food on which they may happen to light. In a public bakery or food shop everything has to be kept clean. This is so important that it is required by law. We are still allowed to be the ones who make the law in our own homes, but for health's sake we must observe it none the less carefully.

Cooking is a *craft*. It is an art that requires knowledge and skill. To become a craftsman—that is, a skilled worker at any handwork or trade—should always be regarded as a great achievement. The boy who in the Middle Ages had served his apprenticeship and won his place as a craftsman in any line of handwork was entitled to many privileges. Cooking is a simple craft. It is not hard to learn if we may learn it by practice and at the elbow of a skilled cook. It is an art or craft worthy our best attention, for on it depends the health and happiness of the household. To the cook falls the planning of the meals. The food to be served must be so portioned that there are fuel foods and life foods in good measure; its ingredients must be combined attractively and in a way that saves and brings out the best nourishment in each; all the dishes must be ready to serve at one and the same minute. The hot things must be hot, the cold things thoroughly chilled. Sweets and sour s must be put together to please our sense of taste. The good cook knows all about tastes and flavors. It is said that the

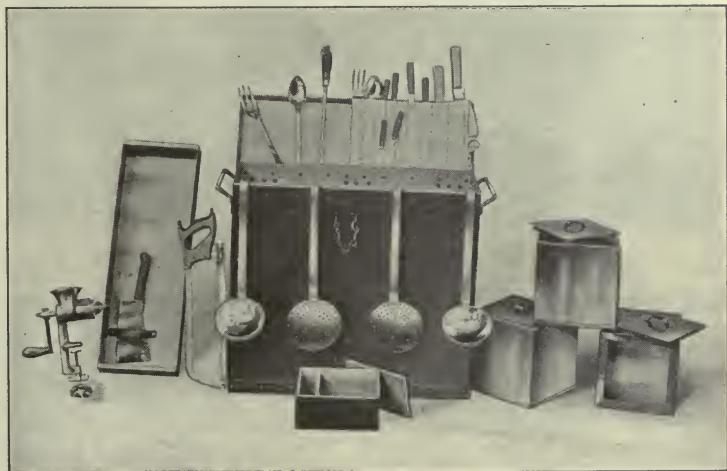
admitted leadership of French cooks in their craft is due to their highly cultivated appreciation of tastes and flavors.

There are four main tastes: sweet, sour, bitter, and salt. Sweets we taste at the tip of the tongue; sour, at the sides; bitter, at the back; and salt, over nearly the whole tongue. When we mix foods to bring out the flavor, we do one of three things. We keep one or other of these tastes separate and distinct, unmixed with anything else, as in salt fish or sweet desserts. Or, second, we plan a meal so that we get one taste after another in quick succession. Or, third, we put them together so that one takes away the sharp effect of the other. For instance, we put sugar with cranberries or apples in making cranberry or apple sauce, the sweet of the sugar to oppose the sour of the cranberry or the apple and make of the two together a taste which we like. We put sugar in lemonade or tea for the same reason. Foods like potato, bread, and cereals are useful because they do not have a highly pronounced taste of their own. We do not tire of them, and we can put a variety of more highly flavored foods with them. There is no end to what the good cook comes to know about appetizing combinations.

When the cook has seen that everything is kept *clean*, which is the first *C*, when she has come to look upon cooking as a *craft* (making herself a skilled, intelligent worker) which is the second *C*, she must look after the *calories* to see that her family gets enough

of energy taken into the body to match their energy output. *Calories*, the units of fuel value, are the third *C*.

She will see, too, that her kitchen is *convenient*. We have new ideas nowadays about kitchen service. We used to say, "That is a good big kitchen"; we are learning to say, "What a convenient little kitchen!" We are beginning to reckon kitchen work by the number of steps taken and to use every device to make this work easy and swift. The big kitchens of the Middle Ages were planned and presided over by



CONTENTS OF THE ARMY COOK'S CHEST

See also same chest closed, above and on page 117

men, who had under them a whole army of helpers. Labor meant little to them. They could have as many steps taken as they wished. When one person must take all the steps, convenience must be considered. Our smallest and most modern kitchens were planned and are used by men. They are the dining-car kitchen



AN ARMY ROLLING KITCHEN

and the army movable kitchen. In the picture you see a most compact and convenient type of army "rolling kitchen." It looks small. Yet it is intended to serve three hundred men and can take care of a considerably larger number. On it a total of 120 gallons of liquid food and 160 pounds of roast meat can be prepared at one time. The kitchen when spread

out is shown here, giving an idea of its very complete equipment, even to the chest with the cook's utensils. We can plan the arrangement of our own kitchens so that the work may be done swiftly and easily.

Lastly, the cook must see that the food, the table, and the manner of serving have *charm*. That is what,



THE SAME KITCHEN UNPACKED

with all its science and labor, the army mess could not achieve. It is something that the simplest home table can easily achieve. The Japanese make of the serving of tea a ceremony which lends to a simple cup of tea a real distinction. The table that was spread for Little Two-Eyes had its white cloth and its silver spoon. This is where boys and girls can begin at once to help

the cook. They can bring the dishes into which the food is to be put and arrange them in the right places on the table. They can set the table with every fork and knife and spoon laid straight. They can pick flowers for the center of the table. Best of all they can bring cheerful faces to table. Then the cook will have her reward for all her work, for "the proof of the pudding is in the eating." A happy, well-fed family is the sign of a good cook.

QUESTIONS

What was the fuel value in calories of the soldier's ration?

How much was your ration in calories?

How much was a farmer's ration? (See page 24.)

How does a family table gain over a hotel or army mess?

What are the four main tastes? How do we combine them in cooking?

What are the five *C*'s which the cook must remember?



CHAPTER XVI

FOOD AND MONEY

All the money in the world would do us no good if there were no food. King Midas found that out. He was fonder of gold than of anything else in the world. When he was given a chance to speak his dearest wish, he wished that everything he touched might be turned to gold. His wish was granted, but how unhappy he was! Every bit of food which he touched turned to gold before he could put it into his mouth. He arose from the breakfast table far richer in money than when he sat down but poorer in comfort, for he was hungry, and he had no prospect, with all his gold, of ever being able to satisfy that hunger with appetizing food. It took him only a few minutes to weary of the gift of the golden touch and rejoice when he was allowed to become an ordinary man again. This is a fairy story, but like many fairy stories it has a thread of truth in it. Money has no value in itself. Its only value is that we can exchange it for what we wish and need. Money is a social convenience and necessity. Robinson Crusoe alone on his island would find it of no value, while a fruit tree would be of great value because it could furnish him food. We all know this, but it is good for us

to stop and think about it sometimes. With money rightly understood and put in its proper place, other things, like food, take their proper place, too. As you think about it I believe food will rise in your esteem, and money, mere money, will take a lower place.

Food and money are always being put into the scales and balanced one against the other. You are doing it yourself every day. You go to the store to buy apples. "How much are apples worth to-day?" you ask. You are putting your money on one side of a scale in your mind and apples on the other. You are asking how many apples will balance in value the twenty-five cents you have in your pocketbook. When you are told the price, you will have found out how much your twenty-five cents is worth in terms of apples. At one time of year, when apples are plenty, your twenty-five cents will be worth twice as much in apples as at another time of year when they are scarce. It seems at first thought as though a quarter had a quarter's worth of value, whether it would buy so many apples or twice as many apples. But you know for yourself it has not. If you need a certain number of apples, you may have to give up two quarters for them instead of one. Your quarter will have shrunk in value since the last time you bought them. As a matter of fact the value of money in the world of business and commerce is being reckoned every day in terms of food value, just as the money in your pocketbook had to be reckoned in terms of apples. The reason for this is that people

must have food. So food becomes a world standard of values. The price of food comes to be balanced with and counted as the worth of money.

Let me give you an example of how this balancing of food and money works out in practical business. A man was trying in my hearing to prove to a customer the other day that the automobile for which he was salesman was cheaper than it was two years ago, although the price in dollars was the same. It cost one thousand dollars two years ago; it was costing one thousand dollars now. "Then how is it cheaper?" asked the customer. "It is cheaper," replied the salesman, "because wheat has gone up in price, and with it everything else has gone up." Wheat is the great staple crop of the United States. The price of wheat does in a way set the standard for other prices and so fix the value of the money in your pocketbook and mine. When wheat goes up in price, flour and bread and fodder for animals and beef and everything else begins to go up, too. It would take more than a thousand dollars in money to buy this year the same amount of wheat that could have been bought for a thousand dollars two years ago. But a thousand dollars would buy the same car. Therefore, said the automobile salesman, the car is cheaper now than it was two years ago. Because all people must have food, whether they have automobiles or not, food is a world standard of value. The prices of wheat are read every day with the greatest interest by men who are handling money all over the world. Your father

could doubtless find them for you in almost any newspaper. Men are reading them to see how much their money is worth to-day and will be worth to-morrow, whether, as they say, "times are hard" or "times are easy."

It is worth while to think about food and money in this way, in which the moneyed people of the world think about them, for you are going to be balancing food and money every day of your life. You must be fed. The two questions that will interest you will be How much money will it take to feed me? and How much money shall I have left when I have been fed? We must have enough to eat; but the less money we spend on food, the more we have for all our other needs. Money spent on food to keep ourselves well nourished is money well spent. Money spent on food beyond what we use or need is wasted money, for when it is gone we have nothing to show for it except, perhaps, doctors' bills if we have overcrowded our body machine. The facts you have learned in this book about the kinds of food your body needs will help you to get more and better food value for your money.

If there is a choice between three foods which you might buy with your twenty-five cents, choose the one with the most food value. Take milk for an example. A quart of milk has, you remember, the same fuel value as nine ounces of round steak or eight eggs. Put your quarter on one side of the scale and see how much more milk you can get for it than steak and eggs. It is

foolish to burn expensive meat for fuel when cereals and their products (breakfast foods, rice, corn meal, flour, and bread) are as good for fuel and much cheaper. Get a bit of meat for flavor and for its life foods, but stoke your furnace with cheaper foods. A cup of cocoa has an amazing fuel value, yet cocoa is not at all expensive.



ALIKE IN FUEL VALUE, UNLIKE IN PRICE

Tea and coffee have practically no food value except as flavors, and they contain elements which are bad for growing boys and girls.

People are becoming wiser in balancing their money against their food and getting the most value for the money they are spending. But there is much that they do not yet know. Boys and girls can learn these facts and be a real help in the family buying. When the price of milk went up a few cents in New York City in war time, the wise people kept right on buying milk,

for they knew that with the way other foods were going up in price milk would give more food value even at fourteen, fifteen, or sixteen cents a quart than other foods they could buy. But in the poorer districts of the city only half as much milk was bought as in ordinary times at the usual price. Those people thought they were



saving money by cutting their milk orders. Probably most other foods which they were buying cost more than milk for an equal food value. But they did not know it. This book is to tell you these facts, so that you will know them. If

anyone told you that learning a few facts and putting them into practice would double the number of pennies or nickels or dimes in your pocket, you would be in a hurry to know what these facts were. When you come to buying food the facts about food values that you have already learned will increase the buying power of your money. They may help in your family-buying now, for if you will eat and enjoy plain, simple foods, your parents will not have to

buy fancy foods to keep you contented. Get your food bulk out of cereals and vegetables; your flavor out of sugar and small portions of meat, out of fruits and the more fancy foods; and your all-round nourishment out of milk, with some eggs cooked in your food. Eat all



A WEEKLY MARKET IN LINCOLN, NEBRASKA

the foods in their season. These are the rules for eating that will make your money worth more in food-buying.

Selling is the second part of the story of food and money as it concerns you, for if you are raising food you may very likely have something to sell. To raise food and then sell it to your neighbors or at local stores is as good patriotism as it is good business. You are creating or cultivating food that would not otherwise be created or cultivated. If you have more of it than you need, you are helping in Uncle Sam's food business

when you put it on the market. It matters not whether you are selling pigs that you have raised or eggs or butter or vegetables. People are buying every one of these products from someone. If your product is good, clean, and sold at a fair price, they might as well buy of you. They will be glad to do so if you are one of Uncle Sam's food army, wearing his badge of service. Remember that part of the business of selling is to find a market that is not overstocked.

Saving is the third part of the story of food and money. It is a wicked waste to buy food and then let part of it spoil or throw it away mixed in with real waste. In preparing food the good cook uses every nourishing bit of the materials she has bought. At table everyone must follow the "law of the clean plate," taking only what he intends to eat and then eating it to the last scrap. In the army they put boys who did not follow the "law of the clean plate," but left good food on their plates, at a separate table, which was soon nicknamed the "hog table." Here they were sometimes given their own left-overs to eat, sometimes provided with stated amounts of food instead of being left to dish out their own portions.

We must not make it necessary to have a special table for us. Left-overs from the main dishes must be made over into appetizing dishes. "Don't feed your garbage pail at the expense of your pocketbook," said Mr. Hoover during the war. It is good doctrine for us all to remember when we think of food and money.

One other way to save is to lay up for the future. This will be described in the next chapter.

QUESTIONS

What do we mean when we say that money is a social convenience?

How do we sometimes reckon the value of money in terms of the food it will buy?

How can you sometimes double the food value of the money in your pocketbook?

How can we so spend our money as to get an all-round diet?
(See chart, p. 177.)

What is the "law of the clean plate"?



CHAPTER XVII

FOR FUTURE USE

As winter follows summer, so the storing of food must follow the harvesting of crops. Man lives on a daily-ration plan, but food does not fall at his feet like manna from heaven, an equal amount each day in the year. It comes by the seasons, and in its season a portion of each crop must be put away for the months ahead. The squirrel knows this and works diligently, storing away nuts for winter. A dog buries a bone for to-morrow. A fable tells the sorry story of the grasshopper that sang all summer while the ants were hard at work laying up winter supplies and then went to the ants in winter pleading for food. "What did you do all summer?" asked the ants, sternly. "I sang," replied the grasshopper. Nature showers a wealth of food upon us. It is for us to save as well as sing during the months of her bounty.

Left to themselves most foods do not keep more than a few hours or days. The processes within themselves which resulted in their growing and ripening do not stop all at once but continue, bringing them soon past the stage where they are palatable. In all living tissue there are tiny life forms, so small that they can be seen only through the microscope, called

bacteria, yeasts, and molds. These forms of life must be killed if the food is to be kept from decay. When they have been killed, the food is sterile. Sterile food will keep indefinitely if closed away from the air.



FISH IN COLD STORAGE

Except for a slight loss of flavor it will have the same taste and appearance when we open it as it did when we closed it months before. It must be kept from the air, for the air is full of tiny forms of life. You have heard them called germs. They will attack any food which is within their reach. Like other plants they need for their life warmth, food, and moisture. Like other plants they cannot live in more than their

normal temperature, but are killed by excessive heat or cold. On these facts depend the three methods of food preservation,—by cold, by heat, and by drying.

Cold is the most common agent for protecting food from too rapid ripening or from spoiling. Food is put into the refrigerator, where the temperature is low. This method is used in homes to keep food for short periods; it is used in great refrigerating plants to keep food for long periods. It is also used when food must be carried long distances. Milk, meat, and other food products come to us in refrigerator cars, kept at a temperature at which the tiny life forms cannot work. In homes food of certain kinds may be stored for long periods in cool, dry places. Apples, pears, potatoes, beets, cabbages, carrots, onions, and turnips are examples of the fruits and vegetables which may be stored in this way. Root vegetables and starchy fruits lend themselves best to this easy method of preservation. Moderate heat and comparative dryness are sufficient for them.

Heat is the most effective and swift agent for killing destructive life forms. Nothing, not even these tiny, persistent bacteria, can live through a few moments of great heat. Canning, preserving, and the making of jams and marmalades all require intense heat. Canning depends on heat, or in the cold-pack method on heat and cold, without the necessary addition of anything but water. Preserving requires the addition of sugar. Old-fashioned preserves used to be made on "pound

for pound " recipes, a pound of sugar for each pound of the fruit to be preserved. Sugar is often added during the process of canning, but it is added chiefly for the flavor, not as a means of "keeping" the fruit. In preserving so much sugar was used for the actual "preserving," or "keeping," of the fruit that the sweetness often covered from the taste the real flavor of the fruit. Nowadays canning is preferred, as an easier and more economical method which keeps the original flavor. Both canning and preserving depend on heat as the agent for killing all the life forms. Water is put with the fruit or vegetable to make possible the heating, as either would burn if direct heat were applied. Last, but not least, the jars or cans must be quickly and tightly sealed from the air so that no outside life can attack their contents.

Vinegar, salt, and spices are used as well as sugar to keep food for considerable periods of time. Like sugar they hinder the growth of any bacteria, molds, yeasts, or germs. They also add flavor. The name given to this way of treating food is pickling. Salt is used also as an assisting agent in connection with another method of food preservation, drying.

Food-drying is an old process, probably the oldest method of food preservation in the world. Early colonists on the Atlantic seaboard followed the example of the Indians in drying their corn, meat, fish, and fruits. Lately, especially during and since the war, this simple method has been revived and extended

far beyond any former use. The government now sends out directions for home drying of fruits and vegetables just as it sends out canning instructions (see page 175). We have learned that much of our food is one-half, two-thirds, three-fourths, or nine-tenths water. Much of this water will evaporate under proper drying conditions. The dried part will then



BEETS BEFORE AND AFTER DRYING

keep almost indefinitely if packed away from the dust. A pasteboard box or a strong paper bag will serve to hold the dried products, as they do not need the careful sealing required for canned fruits and vegetables. In the home this is a convenient, inexpensive, and easy way to take care of small amounts of fruit or vegetables which might otherwise spoil. It may also be used for larger quantities. Dried products are useful in commerce, as they take little space and weigh little compared to the original products

and are therefore profitable and convenient to ship and to handle in retail stores.

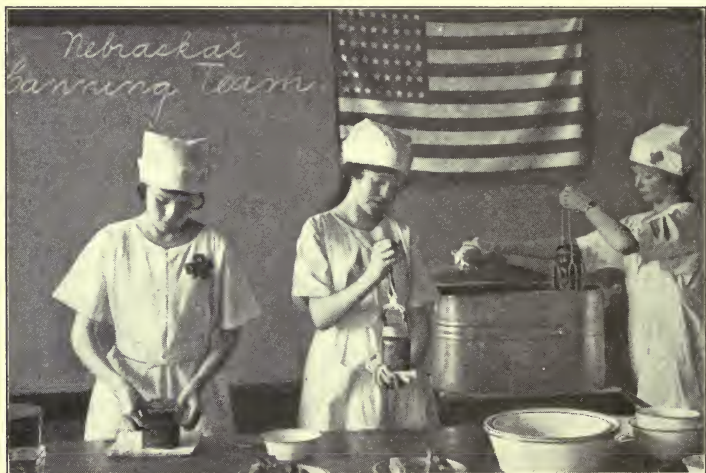
Processes of food preservation are important in the home. Boys and girls have done wonders within the last few years in their canning clubs. Mothers and daughters have formed clubs which report at county fairs thousands of jars to the credit of a small group.



SPINACH BEFORE AND AFTER DRYING

Farmers and housewives have looked on with astonishment while boys and girls from the canning clubs gave demonstrations of swift and successful use of government methods. Every boy and girl should feel a care that fruit and vegetables be not wasted under his or her eyes. Garden products not needed for the table should be put up by some one of these methods for future use. Nor need we depend on our own gardens only. We can watch our neighbors' gardens and the markets to buy any surplus. We can pick berries and

bring them home to be canned. Nothing will taste so good in the winter months as the contents of these jars, brought out one by one from the preserve closet. They will also prove far less expensive than similar canned products purchased at the stores. While all



A CHAMPION DEMONSTRATION TEAM

these methods of food-storing are home processes, they are also in far greater measure commercial processes. What used to be done in the home, and the home only, is now done on a big scale in the factory, and our home tables are the gainers. The good housewife likes, however, to depend on her own product.

The United States is the largest producer and consumer of canned goods in the world. About

one hundred years ago an Englishman brought to America a process, which was at the same time being patented in France, of sealing food in air-tight containers. It was demonstrated that food so sealed would keep indefinitely. The problem was how to manufacture air-tight containers inexpensively and in large quantities. Then came the tin can. Some day someone will write the romance of the tin can, that humble container of food which we take so for granted and treat with so little respect. The tin can lengthened man's food tether almost indefinitely. Before its manufacture men who had gone in sailing vessels on long whaling expeditions, being away from home supplies of fresh food for a year or more, had often come home ill with diseases directly due to the lack of vegetables, fruits, and milk. Now they could carry these necessary elements of diet in cans and live healthily and well. "Canning," it has been said, "more than any other invention since the introduction of steam, has made possible the building up of towns and communities beyond the bounds of varied production." It has made possible the interchange of foods in the world's Food Market. The tin can has had its share in enabling us to sit at a world table.

To store food wisely is a sign of thrift. Nature has given to America a wonderfully bountiful provision of food. To waste any part of it is a national sin. To save what we need for ourselves and to put the rest into such form that it can be sent to those in other

lands who need it is a national duty. By doing our personal share in seeing that food is saved, not wasted, we can help in this great patriotic service.

QUESTIONS

What conditions do bacteria require for their life?

By what processes may we take away these conditions from them and so preserve food?

What is the difference between canning, preserving, and pickling?

How did the tin can help in the discovery of the north pole?

How did it help in the winning of the war?



CHAPTER XVIII

FOOD AND HEALTH

The Chinese have a custom of paying a doctor to keep them well. Our way has been to call a doctor only when we were ill, paying him for his services during the illness. Their way would be to pay a doctor so much a year. If the man keeps well the doctor has no further duties. In case of illness the doctor must attend his patient without extra charge. The Chinese are not sufficiently skilled in the medical knowledge which prevents disease to have this plan work out very well, but the plan itself is a splendid one. It is the modern idea which is being adopted in schools and factories, as well as in the army and navy, to prevent illness rather than to wait for it to come upon us. This book, and especially this chapter, takes the place of the Chinese doctor, whose business it is to see that his patients keep well. In the chapter on Food and Money it was said that the knowledge you gain from this book may double and triple the money in your pocketbook. If you will follow the rules given in this chapter they will save you doctors' bills and much discomfort. Good health depends in large measure on food. It is not hard to keep well, for good health is natural and normal; it is

much harder to get well after an illness. So pretend that you have called in your doctor and told him you want him to keep you well and that these are his instructions.

The state of Massachusetts prints its "Food Rules for School Children" on a card which every child may have. We will take these rules as those of our doctor and test them by our knowledge to see if we can tell why the Department of Health prescribed them for the children of Massachusetts.

1. *Begin the day by drinking a glass of water and drink at least six glasses during the day.*

Why was this rule put in? We have learned that two thirds of our body weight is water. Every cell in our bodies, every tissue of living matter, needs water. Every bit of our food must be carried in liquid form to the hungry and thirsty parts of the body. Water helps, also, to keep up the body processes; it helps to carry off waste. Solid food does not give us water enough. Nature helps children in keeping this rule by making them thirsty.

2. *Do not go to school without breakfast.*

Why not? Because you will be hungry; not only will the conscious, thinking You feel hungry but the Body Self will need food. It has gone through a long night without food; now it must have something on which to work.

3. *Eat regularly three times a day.*

We learned in Chapter XI that the body becomes accustomed to having its food at regular times and adapts its ways to those times. Also, the body can handle its daily ration in three parts more easily than all at once.

4. *Eat slowly and chew all food well.*

Why? First, to get the full taste. We shall not have that taste more than an instant at best. If we do not roll the food around a bit in our mouths, it may not touch those taste buds which are ready to appreciate it. We taste sweet, you remember, on the tip of the tongue, sour at the sides, bitter at the back, and salt nearly all over the tongue. If a food is a mixture, as most foods are, it must touch nearly the whole tongue for us to get its best flavor. Second, there is an agent in the mouth that wants to begin to split some kinds of food apart. We must give it a chance to do it. Third, the food must be chewed. Food for the stomach should be in a soft, pulpy form. Our teeth are put into the mouth to enable us to change the food from solid to semiliquid form. The saliva helps on the process. To send food down to the stomach in pieces and chunks of solid matter is not fair to the Body Self.

5. *Drink milk every day; four glasses are not too much.*

What are the reasons why we should drink milk? It is an all-round food, coming nearer to being a complete diet in itself than any other food. It has in it fat,



ONE CORNER OF A FLOURISHING SCHOOL GARDEN

milk sugar, two desirable proteins, calcium for bones, iron, and vitamins for growth. It is easy for the body to take into itself. It fits in with other foods which we commonly eat and makes up in elements which they lack. It is economical. What else did we learn about milk? To keep it clean, to keep it cool, and to keep it covered. This is because it is easily changed by those life forms, the bacteria, of which we were speaking in the last chapter. (See charts, pp. 172 and 173.)

6. *Eat some breakfast cereal every day.*

Why? Cereals are good fuel foods. They give bulk. They have necessary life elements. They are not expensive.

7. *Eat some vegetable besides potato every day.*

Vegetables give bulk, mineral matter, vitamins, and some protein and fuel food. They supply a good variety in the diet.

8. *Eat bread and butter at every meal; dark breads are best.*

Bread and butter are almost a diet in themselves; dark breads have some food elements which are lost in making the flour white.

9. *Eat some fruit every day. Spend the pennies for apples instead of for candy.*

"An apple a day keeps the doctor away" is a good proverb to remember. Fruit gives to our diet minerals, liquids, and some fuel food. It has a little life food, and it adds flavor and variety to our meals.

10. *Do not eat candy between meals ; eat candy and other sweets only at the end of a regular meal.*

Candy is a concentrated fuel food of high heating capacity. Put in between meals it is likely to choke



A SCHOOL LUNCH IN NEW YORK

the furnaces and stop you from getting the energy you want to keep your body processes going and let you run and play.

11. *Do not drink tea or coffee ; it does the body no good but does it harm.*

Tea and coffee are taken for their flavor. They do not add food value, and they have in them elements which are particularly bad for growing boys and girls.

12. *Do not eat or touch any food without first washing the hands.*

13. *Do not eat fruit without first washing it.*

14. *Do not eat with a spoon or fork which has been used by another person without first washing it.*

15. *Do not drink from a glass or cup which has been used by another person without washing it.*

These last four rules are for that cleanliness in serving and eating that must also be carried out in cooking. Dirt and disease germs are always floating about in the air. Food is going to be allowed entrance to the inside of our body. It must go in clean, not carrying with it germs which will do harm.

The Child Health Organization in New York City puts its rules and principles in an alphabet, the "Child Health Alphabet."¹ Here are a few of its twenty-six food letters:

B is for *Butter* and *Beans* and *Brown Bread*;

Also for *Baths* before Breakfast or Bed.

C is for *Cereals* and *Cocoa* too;

Consider the *Calories* coming to You.

I is for *Iron* in Spinach and Eggs,

Builds Red Blood and Sinews for Strong Arms and Legs.

M is for *Milk*, which makes *Muscle* and Bone;

Not less than a Pint every day till you're grown.

S is for *Sugar* and *Sirup* and *Sweets*;

Every Child must have occasional Treats.

T is a Topic which Trouble begins;

Both *Tea* and Coffee for Children are Sins.

W is for *Water*, the best thing to drink

Between Meals as often as ever we think.

¹ Copyright, Child Health Organization, 1918.

These are two ways to put the rules by which your food business is to be run into a form that will help you to remember them. Why not make a food card or an alphabet of your own? Then you can repeat it over and over until you know it so well that you will always remember to act by it.



CHAPTER XIX

FOOD AND THE GOVERNMENT

Group life makes for the convenience and comfort of each member of the group. This is true of a family and a small community. It is equally true of a nation. A single member of a group rarely gives as much to the group in the way of service as he gets from it in assistance and protection. No one of us ever renders to our government a quarter or a tenth or a hundredth part of the service which our government gives to us.

This is especially true in regard to our food. Our government did not wait until it called a citizen army from their homes and put them into camps to look after their food. It had been looking after the food of each member of that army in his home. In camp it could control his food. Before he went into camp it could only watch over and protect so far as was possible the food which he was likely to buy. It had watched over his milk, to make it possible for him to buy clean and rich milk. It had inspected his meat at every stage, from its source until it was handed to him over the counter by a clerk. It had tested the contents of sample cans of food before the manufacturer was allowed to seal and

send his product. The government had not actually fed each man until he came into the army. But in so far as it could it had taken the part of the taster who used to taste the king's food before it was put on the table. It has done what it could to protect the man from taking a mouthful of food which was not clean, pure, and wholesome.

Food protection is not new. We read in the laws of England as far back as 1773 that "a standard wheat loaf shall weigh three fourths of the wheat of which it is made." This means that only one fourth of any ingredient except wheat was allowed in the loaf of bread which the public baker might sell. The man whose bread was found to be below standard might be drawn through the streets on a hurdle with the offending loaf tied about his neck. So public a punishment would surely make him mend his ways in the future.

If a family could raise all its own food, supervising every process through which it is put, it could protect itself. At least the family would be responsible for any lack of cleanliness or any impurity in the process or the finished product. Many hands must touch it before it comes to our tables.

As soon as people begin to exchange food, they lose direct knowledge of the food in its journey from its source to its destination. When this food exchange comes to take place in a county, a state, and a continent, a single person cannot trace his

food. Food inspection must then be taken over by the government. There must be pure-food laws. We have seen how food is made up of many elements. For the sake of greater profit or for the sake of keeping food longer from spoiling, manufacturers and men



A MINNESOTA CHAMPION TEAM

who handle food in large quantities are tempted to substitute one element for another in food in a way that is not fair to the person who buys it. There may also be danger to his health. The government takes account of all these possibilities. It instructs the makers of canned goods to print on the label of each can a statement of what is in the can. The

buyer may then know exactly what he is buying. It makes out general requirements, which are like the recipes in cookbooks, as standards for flour and milk and similar staple foods. We should be very grateful to the men who worked for many years to get pure-food laws on our statute books and are on the lookout to see that they are enforced.

The land of a people is its wealth. The care of the land is in the hands of the farmer. He holds the land as trustee for a hungry world. Out of the land occupied by the farmer must come not only the necessary food for himself and his family but also a surplus for the markets of the world. Farmers of the twentieth century have done splendid service in increasing the crops from the land. In this the government has helped and encouraged them. To take crops from the land as coal is taken from a mine is to make the land poor for the future. From fertilizers the land gets back the needful elements which crops have taken from it. To plant crops which need one kind of soil on land fitted for another kind of crop is to fail to get the best from the land. From being an occupation by which one might earn a living farming has become a science. On the farmer rests the responsibility for feeding the world. The government does well to recognize him as the chief partner in its food business and give him the benefit of all its stores of knowledge and experience. Every boy and girl who has even a tiny

garden may get the help and advice of the government through the Department of Agriculture, Washington, D.C. Farming is the most important and most necessary business in the world. Everyone who chooses it for his or her vocation comes under the special notice and protection of the government.




READY FOR WORK

Over in France there was at the headquarters a huge bulletin board on which were hung reports of the quantities of food in every army depot in France. It was kept up to date by a constant shifting of the reports. Anyone looking at that board could tell exactly the amount of food available for the army at any given time or place. The government at Washington has similar knowledge of all the food in this country. It publishes monthly surveys, which

farmers and market men may receive, showing how much food of every kind is on hand. It tells how many bushels of wheat or pounds of meat or butter are in storage, how many are being moved, and how many will probably be available in the near future. Such information, gathered from all over the country, puts the government in a position where it can plan for and advise its citizens. It is as if the department in Washington were on a mountain top, looking out over its fields and warehouses. From this mountain top it makes its survey, considering the feeding of millions of people as if they were a unit, a single family.

In war time the people of the United States taught themselves and the world a wonderful lesson in democracy. Looking out from Washington and regarding the people of the United States as a unit, the people saw that their food supply must be treated as a whole and portioned out with infinite care if all the people were to be well fed and the necessary amount of food sent abroad. So the government added to its usual departments for protection and advice and assistance a Food Administration. Food control by a government is nothing new. Every autocratic ruler down the centuries had practiced food control by some arbitrary rationing system. It was the glory of our democracy that the people responded, went more than halfway to meet the government. So readily and willingly did they respond

An artistic illustration of three fish swimming in a dark, textured water environment. The fish are depicted with detailed scales and fins. One fish is at the top, another slightly below and to the right, and a third is at the bottom, all facing towards the left. The background is dark and moody, suggesting an underwater scene.

Save the
products of the Land

Eat more fish —
they feed themselves.

UNITED STATES FOOD ADMINISTRATION

to the appeals of Mr. Hoover and his fellow administrators for food conservation that the element of necessary control by the government was completely overshadowed by the voluntary self-rationing of the people. As the recruit in the army camps was taught that in saluting his officers he was saluting the authority which as a free citizen of the republic he had himself had a hand in setting up, so the people in accepting their food rations recognized that this was no arbitrary order from above. Their own government was acting for them. It was showing them how to use well and wisely the food in their possession. If, as has been said, food is the test of democracy, our democracy met the test and came out victorious.

QUESTIONS

How does the government protect food?

Why must we depend on the government to look after our food?

How is the farmer trustee of the land?

How did the people meet the government's war-time food control?

CHAPTER XX

AT A WORLD TABLE

The graduates of one of the great colleges live in almost every state in the Union. Each year the graduates of different sections of the country meet in some city convenient to them all and hold a banquet. This year they planned that all these scattered groups should hold their annual banquet in their accustomed cities at exactly the same moment. This meant that some of the banquets had to be held at unusual times of day because of the differences in standard time. It was further arranged that all these banquet tables should be connected by telephone, each guest having at his plate a telephone receiver of his own. The result was that friends two thousand miles apart sat listening at the same moment to the same after-dinner speeches. The group in San Francisco spoke to the group in New York City, and Chicago, Seattle, and Baltimore listened and took their turns in the conversation. Though they were hundreds of miles apart, in thirty-five different cities, these graduates were, so far as communication was concerned, sitting at the same table.

Newspapers serve the same purpose as telephone receivers in making us remember that while we are

sitting at our own tables we are also sitting at a world table. Even as we buy at a world market and eat from a table spread with foods from all over the world, so we sit at a table at which is seated with us all the rest of the hungry world.

War has brought the picture of a world table freshly to our minds. The United States gave its splendid example of voluntary self-rationing because of the appeal of other members of the world family who were rising from the table hungry because there was not food enough to satisfy them. The United States had food in plenty for itself. It deliberately set aside a part of that food for the needs of the warring nations. It sent out of the country food which it might have eaten, because Americans would not stuff themselves with plenty while others starved. This was a beautiful thing to do; but it was the only thing to do. No man or woman or child could have enjoyed food if he had been actually sitting at table with hungry Belgians or Serbians or Poles or Armenians who were not being fed. The danger was that we should forget these other members of the world family because they were out of sight. That is the danger always. We need to stir our imaginations to picture this world table. When we are tempted to leave good food on our plates or to throw away a piece of bread, we must train ourselves to see some hungry child reaching out for bread and not getting it because there is not enough to go around. The chief lesson of sitting at a world table is not to waste.

If we eat what is set before us we release for sending overseas other foods which are needed there.

The sharing of food is the sign of a new world brotherhood for which men everywhere are hoping and working. Science has made it possible for the world to become one, sitting at one table. A man can speak



SERVING TEA IN JAPAN

from Wales to Australia by wireless message in a fifteenth part of a second. Surely no nation need go hungry without other nations' knowing of its need. Our land and ocean systems of transportation make it possible to send food quickly. Our new scientific farming makes it possible to raise food to feed adequately the nations of the earth. The land has never been worked as it can be worked. Two blades of grass can be made to grow where one grew before. A small plot

of ground properly enriched and tended and protected from pests will yield far more than it ever yielded under old farming methods. Yet without the vision of a world table and the desire for a world brotherhood science alone would be slow in saving the world from famine.



BOY-SCOUT GARDENERS

To-day we are all summoned to take part in a new crusade—to drive famine from the earth. Famine is a dreadful specter that has always stood just behind the poor man and the nation whose food supply was barely equal to its needs. It has been ready to pounce on its victims the moment wages ceased or a crop failed, bringing with it attendant woes of disease and anarchy. It is the enemy of law and order, the foe of prosperity and contentment.

To drive famine from the earth more food must be raised. Even before the war the world was in danger of going hungry. The population of the globe is increasing. Its food supply must therefore increase. Every human being must eat; he must be a consumer of food. The more need there is of food, the more producers there must be. "Everyone who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations," said President Wilson. To solve this problem there must be more than gardeners; there must be farmers. The farmer is the leader in the world crusade against famine. To be a food producer is to be an active partner in the world's food business, and active partners were never more needed. Boys and girls should think, when they are choosing what they will be, whether they can choose this for their vocation. If they can, they will be doing a splendid service.

To drive famine from the earth there must be less waste. Here everyone can take a part. "This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and woman assume the duty of careful, provident use and expenditure as a public duty."

To drive famine from the earth there must be world brotherhood. Here boys and girls can help. When boys and girls do anything, they do it with all their might. They do it joyfully as an adventure. They do it all together as they would play a game. They do it

in the spirit of King Arthur's knights, who "rode abroad redressing human wrong." For them

every morning brought a noble chance,
And every chance brought out a noble knight.



U. S. Official

AMERICAN SOLDIERS SHARING WITH FRENCH CHILDREN

They gloried in a vision of a world protected and purified by their valor, and in that vision wrought

All kind of service with a noble ease
That graced the lowliest act in doing it.

To raise food or save food without a vision, as many worthy folks are doing, is good service, but it is not

the kind of service that makes of the world one brotherhood. For that we must have the vision. Boys and girls are the ones who can catch the vision and work for it. They can keep before themselves and others the vision of all the world seated at one table, repeating together the familiar prayer, "Give *us* this day *our* daily bread." They can help to answer that prayer for the world, and so become, like Arthur's knights, "the fair beginners of a nobler time."



PARTNERS

To be good partners in the world's Food Business, we must

Remember

- To eat with enjoyment food which the body needs ;
- To buy wisely, getting the best food value for our money ;
- To prepare food carefully and serve it attractively ;
- To raise from the land as much food as we can ;
- To store for the future the crops in their seasons ;
- To save food from waste in our homes and in our communities ;
- To honor the industries and workers contributing to our world table ;
- To make ourselves worthy to sit at the world table,
 - By reminding ourselves always to save and share,
 - By keeping before ourselves and others the vision of a world table, at which everyone is fed, so that in our time famine may be driven from the world.

*As partners in the world's Food Business
We so covenant.*

FACTS AND FIGURES

FOR TEACHERS AND PUPILS

I

WEIGHT AS A TEST

For growing boys and girls weight is the quickest and surest index of health. The child who has become interested in the successful management of his own personal department of the food business should be taught to regard his weight and, more important still, his rate of gain in weight as the test by which he may know whether he is supplying to his body the right kinds and amounts of food. Children should be encouraged to keep their monthly weight records, comparing them frequently with the standards in the tables given below. A "Class-Room Weight Record" containing these tables, with spaces for monthly records for a group of children throughout the school year, is issued under the authority of the Bureau of Education of the Department of the Interior and may be obtained at a nominal cost through that office in Washington or through the Child Health Organization, 156 Fifth Avenue, New York City. The latter organization, which is acting with the National Child Labor Committee in promoting interest in this important subject, has other material useful in the schoolroom, including tags to be used in weighing contests, to carry the facts into the children's homes.

RIGHT HEIGHT AND WEIGHT
FOR BOYS¹

Height inches	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.
45	49					
46	51					
47	53	54				
48	55	56	57			
49	58	58	59			
50	60	60	61	62		
51	62	63	64	65		
52	64	65	67	68		
53	67	68	69	70	71	
54	70	71	72	73	74	
55	73	74	75	76	77	78
56	77	78	79	80	81	82
57	...	81	82	83	84	85
58	...	84	85	86	87	88
59	...	87	88	89	90	92
60	...	91	92	93	94	97
61	...	...	95	97	99	102
62	...	...	100	102	104	106
63	...	...	105	107	109	111
64	...	...	...	113	115	117
65	...	...	...	...	120	122
66	...	...	...	...	125	126

RIGHT HEIGHT AND WEIGHT
FOR GIRLS¹

Height inches	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.
45	49					
46	51					
47	52	53				
48	54	55	56			
49	56	57	58			
50	58	59	60	61		
51	61	62	63	64		
52	64	65	66	67		
53	67	68	68	69	70	
54	69	70	71	72	73	
55	72	73	74	75	76	77
56	76	77	78	79	80	81
57	...	81	82	83	84	85
58	...	85	86	87	88	89
59	...	89	90	91	93	94
60	...	...	94	95	97	99
61	...	...	99	101	102	104
62	...	...	104	106	107	109
63	...	...	109	111	112	113
64	...	...	...	115	117	118
65	...	...	...	117	119	120
66	...	...	...	119	121	122

RATES OF GAIN

A boy should gain about eight ounces a month from the time he is eight years old until he is twelve years old; then he should begin to gain at the rate of sixteen ounces a month for the next three or four years, returning to a gain of eight ounces a month from the ages of sixteen to eighteen years.

A girl should gain about eight ounces a month from the time she is eight years old until she is eleven years old, twelve ounces a month

¹ Prepared by Dr. Thomas D. Wood

[illegible][illegible]

AGE	PERCENT
5 to 9	6.0%
10 to 13	8.0%
14 to 16	12.0%
17 to 19	18.0%
20 to 24	8.0%

AGE		
5 to 8	_____	5 OZ.
8 to 11	_____	8 OZ.
11 to 14	_____	12 OZ.
14 to 16	_____	8 OZ.
16 to 18	_____	4 OZ.

DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80																				

Height and weight to be taken in house clothes, without shoes. Weigh on the same day each month. Age the nearest birthday.
Each child to enter his own weight.

from the time she is eleven years old until she reaches the age of fourteen, eight ounces a month from the ages of fourteen to sixteen, and four ounces a month from the ages of sixteen to eighteen years.

In Chapter I attention is called to the child's weight as showing the part he has already taken in the food business. From this time on he should be taught to regard the frequent taking of his weight and the keeping of a record of it as a business man would regard monthly stock-taking or the making up from his books of a trial balance. Emphasis should be laid on the fact that it is not necessarily the amount of food eaten which is affecting this record but the kind of food, not the expense but the proportion of needed elements. The records should not be taken too seriously, but should be treated throughout as a "trial balance." Other conditions besides food enter into the matter, but food is one of the chief elements, as the child who is reading this book will readily see. Moreover, it is the element in which the child may take the most active part by controlling his appetite and directing his tastes into right channels.

In Chapter IV weight takes on a new interest as an index of the number of calories required. Here, as elsewhere, the figures are introduced chiefly to arouse interest. The final impression is to be of the importance of weight as an index — on the one hand, of food requirements, and on the other hand, of health.

II

THE GARRISON RATION WITH ITS SUBSTITUTES 1918-1919

From this garrison ration, referred to in Chapter II, the child will get his first idea of an exact, scientific ration and of the principle of substitutes. The basis of all substitution in

diet is the actual food value for body needs. The closer the resemblance of a substitute to the article which it replaces in flavor, appearance, and texture, the more satisfactory it is from the standpoint of human choice and instinct, but as a substitute its only essential is that it shall be as nearly as possible equivalent in food value. This point may be emphasized later in the choice of foods from the point of view of economy.

Following the style of this table, children will enjoy making out daily and weekly rations. It is suggested that they group the articles of their diet as fuel foods and life foods.

GARRISON RATION WITH SUBSTITUTIVE ARTICLES FOR OVERSEAS

COMPONENT ARTICLES AND QUANTITIES	SUBSTITUTIVE ARTICLES AND QUANTITIES
Beef, fresh 20 oz.	Mutton, fresh 20 oz.
	Bacon 12 oz.
	Ham 12 oz.
	Meat, canned when impracticable to furnish fresh meat . 16 oz.
	Hash, corned beef when impracticable to furnish fresh meat 16 oz.
	Turkey, dressed and drawn on Thanksgiving Day and on Christmas Day; when practicable, drawn 16 oz.
	Turkey, undrawn 19 oz.
	Pork, salt—in Alaska only . . 16 oz.
	Beef, salt—in Alaska only . . 22 oz.
	Cheese 4 oz.
	Sausage 12 oz.
	Fish, dried 14 oz.
	Fish, pickled 18 oz.
	Fish, canned 16 oz.
	Fish, fresh, drawn 18 oz.
	Fish, fresh, undrawn 22 oz.
	Sardines 16 oz.

GARRISON RATION WITH SUBSTITUTIVE ARTICLES FOR OVERSEAS
(Continued)

COMPONENT ARTICLES AND QUANTITIES	SUBSTITUTIVE ARTICLES AND QUANTITIES
Flour 18 oz.	Bread, soft 18 oz.
	Bread, hard, to be ordered issued only when the in- terest of the government so requires 16 oz.
	Corn meal 20 oz.
	Hominy, fine 16 oz.*
	Crackers, assorted 16 oz.
	Oatmeal 16 oz.
Baking powder08 oz.	Hops08 oz.
	Yeast08 oz.
	Yeast food08 oz.
Beans 2.4 oz.	Rice 1.6 oz.
	Beans, baked, when impracti- cable to cook meals 4 oz.
	Soup, canned 8 oz.
	Soup, powdered 1 oz.
	Soup, concentrated $\frac{1}{3}$ oz.
	Farina 4 oz.
	Hominy 4 oz.
Potatoes 20 oz.	Potatoes, canned 15 oz.
	Potatoes, sweet 20 oz.
	Potatoes, sweet, canned . . . 15 oz.
	Vegetables, dehydrated . . . 5.5 oz.
	Onions, in lieu of an equal quantity of potatoes, but not to exceed 20 per cent of total issue.
	Tomatoes, canned, in lieu of an equal quantity of pota- toes, but not to exceed 20 per cent of the total issue.

GARRISON RATION WITH SUBSTITUTIVE ARTICLES FOR OVERSEAS
(Continued)

COMPONENT ARTICLES AND QUANTITIES	SUBSTITUTIVE ARTICLES AND QUANTITIES
Potatoes (<i>continued</i>)	<p>Corn, sweet, canned, in lieu of an equal quantity of potatoes, but not exceeding 20 per cent of total issue.</p> <p>Peas, green, canned, in lieu of an equal quantity of potatoes, but not exceeding 20 per cent of total issue.</p> <p>Spinach, canned, in lieu of an equal quantity of potatoes, but not exceeding 20 per cent of total issue.</p> <p>Other fresh vegetables (not canned) when they can be obtained in the vicinity or transported in a wholesome condition from a distance, in lieu of an equal quantity of potatoes, but not exceeding 30 per cent of total issue.</p>
Prunes 1.28 oz.	<p>Apples, dried or evaporated 1.28 oz.</p> <p>Jam, assorted } Not to ex-</p> <p>Jelly, currant } ceed 50 per</p> <p>Apple butter } cent of total 2.56 oz.</p> <p>Preserves, ass't } issue</p> <p>Peaches, canned 4 oz.</p> <p>Pears, canned 4 oz.</p> <p>Pineapple, canned 4 oz.</p>
Coffee, roasted and ground 1.12 oz.	<p>Coffee, roasted, not ground . 1.12 oz.</p> <p>Coffee, green 1.4 oz.</p> <p>Tea, black or green 0.32 oz.</p> <p>Coffee, instantaneous 1.12 oz.</p> <p>Cocoa 1.12 oz.</p>

III

THE CALORIE

The calorie of food tests is the Calorie, or "large calorie," of the physicist, the amount of heat required to raise the temperature of one kilogram (2.2046 pounds) of water one degree centigrade. This is very nearly the same as the heat required to raise the temperature of four pounds of water one degree Fahrenheit.

The child who weighs a quart of water will find that it weighs about two pounds. One calorie of heat will raise the temperature of two quarts of water about one degree Fahrenheit, always provided no heat is lost in the surrounding air or in the container. A common unit for food values is the 100-calorie portion, which amounts to an average helping at table of many foods. Such a portion gives in the body, by a rough estimate, heat equivalent to that involved in raising the temperature of a quart of water from the freezing to the boiling point. To drink a little over half a cup of milk is to release in the body heat-energy corresponding to that used in heating a quart of ice-cold water until it boils. By comparisons like these some idea may be obtained of the amount of heat-energy involved in the processes of daily life. The pupil may be reminded that the body must be kept at a temperature of 98.6 degrees, no matter what the temperature of the surrounding air.

If the question arises as to how it is known that actual heat-energy is released, the method of food-testing in a calorimeter may be described. A carefully weighed sample of food is placed in a capsule within a steel vessel or bomb. The bomb is then charged with oxygen and is lowered, tightly closed, into

a larger vessel, where it is surrounded by a known weight of water. An electric spark starts combustion. The heat liberated in the process of the union between the food and the oxygen within the bomb raises the temperature of the surrounding water as surely as would a gas flame burning beneath the water. From such tests as these, carried out with minute accuracy, it has been found that a gram of pure protein or of pure carbohydrate yields in the body four calories of heat, and a gram of fat, nine calories. For purposes of simplicity protein has been classed for its essential qualities as a life food. It always contributes some fuel value for the body processes. If the body is short of fuel a larger proportion of protein will be used as fuel, but to force the body into using an excess of protein as fuel when cheaper and more satisfactory fuels may be easily supplied is like stoking a furnace with a precious substance which will burn but which is more needed for other purposes. The teacher who is clear on these points will make such use of them with the class as occasion requires.

IV

THE 100-CALORIE PORTION

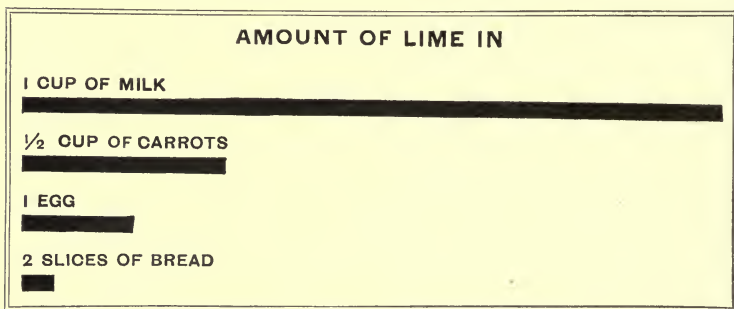
A general sense of food as fuel is all that is needful for children. The interest of the idea usually arouses the curiosity of the child as to the fuel value of the food he eats. The list of 100-calorie portions here presented will satisfy this interest and serve as a basis for practical home application of the facts learned. A 100-calorie portion is, in most of the cases given, an average serving of the food listed. The pupil who has come to a sense of money values of food can easily see the differences in relative cost of the various portions.

- 1 small corn-meal muffin
- 2 slices of white bread $\frac{1}{2}$ inch thick by $3\frac{1}{2}$ inches square
- 3 small slices of Graham bread
- 1 cubic inch of butter
- A medium-sized ripe banana
- A large boiled egg
- 2 scant level tablespoonfuls or one heaping tablespoonful
of granulated sugar
- $3\frac{1}{2}$ lumps of sugar
- $\frac{5}{8}$ cup of milk (whole)
- $1\frac{1}{8}$ cup of milk (skim)
- $\frac{2}{3}$ to $\frac{1}{3}$ cup of cocoa
- $2\frac{1}{2}$ teaspoonfuls of peanut butter
- 18 single medium-sized peanuts
- $\frac{1}{2}$ cup of scalloped potatoes
- $\frac{1}{3}$ cup of baked custard
- $\frac{1}{4}$ cup bread custard pudding
- $\frac{1}{4}$ cup of apple-tapioca pudding
- 2 large molasses cookies
- 2 medium-sized chocolate creams
- $1\frac{1}{2}$ tablespoonfuls of apple sauce
- $\frac{1}{2}$ cup macaroni and cheese
- 1 cup of oatmeal (cooked)
- 1 large apple
- $\frac{1}{2}$ large apple baked with two tablespoonfuls of sugar
- $\frac{1}{2}$ baked apple served with whipped cream
- 3 or 4 unstoned dates
- 4 medium-sized prunes
- 2 cooked prunes with two tablespoonfuls of prune juice
- 1 large bunch of grapes
- $\frac{1}{2}$ cup of grape juice
- 1 large orange
- 1 medium-sized potato

V

TASTE AND SMELL

Children will be interested to prove by experiment on themselves the important part smell plays in relation to the palatability of food. At a dinner table where the subject came up recently guests promptly tested their powers of taste by eating highly flavored mints with eyes and nostrils closed. They were amazed



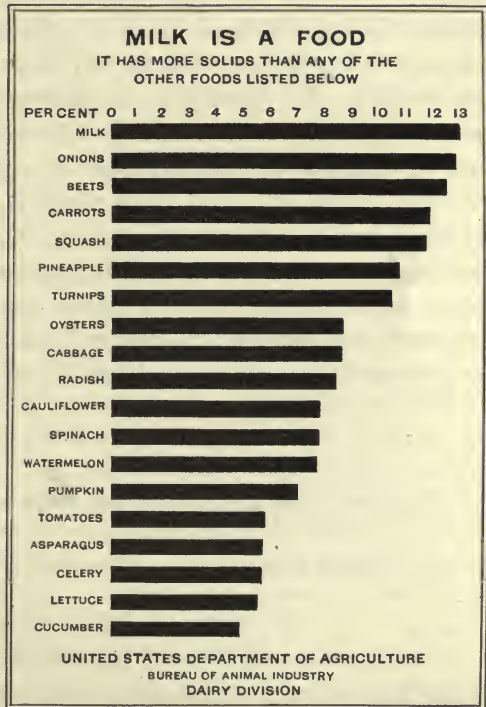
to find themselves unable to distinguish between a variety of kinds. Experiments along these lines help to emphasize the truth that excellent food value may reside in a food which does not especially appeal in flavor or other appetizing qualities.

VI

MILK

Too much emphasis cannot be laid on the importance of milk as a chief feature of diet for children. The accompanying charts indicate two points which will interest and impress children and adults. Because milk is a liquid we are inclined to think of it as a beverage rather than as a food.

The length of each black line on the chart indicates the proportion of combined carbohydrate, fat, protein, and mineral constituents in the food listed. This represents what we are accustomed to call the solid part of the food. The rest of the hundred per cent is water. When the water content of each of these foods is analyzed, it exceeds by the amount indicated that of milk. The remainder of each line, as it could be extended on a wide black-board, might be labeled "Water." Milk is 87 per cent water; the per cent of water in the other foods listed is in each case higher.



Children are interested in lime (calcium) because it is needed for the building and renewing of bones, teeth, etc. The ordinary American diet is more apt, it is said, to be deficient in calcium than in any other element. Milk is by far the most important calcium-containing food (see chart, p. 172). On the other hand, the iron content of milk is low.

Another method of approach to the milk question is the consideration of the dairy cow as the greatest animal food-producing machine in the world. The figures here given are from Leaflet Q, issued by the Massachusetts Dairy Bureau, State Board of Agriculture. "Take, for example, a cow weighing 1000 pounds while in milking condition. Good dairymen do not consider a cow worth keeping unless she gives 6000 pounds or more of milk per annum. A cow weighing 1000 pounds and yielding 5000 pounds of milk per year produces five times her own weight in a food all of which is digestible, and all of which is not only the most complete food known but is also the least expensive among foods of animal origin. To produce Steer Beef requires $2\frac{1}{2}$ to 3 years; to produce Baby Beef requires 6 to 8 months; to produce Veal requires 6 to 8 weeks; to produce Milk requires 12 hours."

VII

SCHOOL CHILDREN AND THE GOVERNMENT

The United States School Garden Army, with its slogan

A Garden for Every Child,
Every Child in a Garden,

is the first national organization which children in school will be likely to join. Inquiries concerning its organization, badges, garden manuals, enlistment sheet, etc. should be addressed by the teacher to

The United States School Garden Army
Bureau of Education
Department of the Interior
Washington, D. C.

Any organization of school children doing garden work is eligible for enlistment. The number of members in a company is from ten to one hundred and fifty. The requirement for membership is the signing of an enlistment sheet in which the pupil agrees to raise one or more food crops and to keep records of his work and the results, reporting them to the teacher or garden supervisor. Bronze service bars, with varying insignia for privates and officers, are furnished to garden soldiers. Every pupil enlisting in the School Garden Army is also entitled to display a service flag.

Gardening is the oldest and most essential of the arts. Long before the dawn of recorded history the human race became proficient in those garden practices that enabled it to subsist upon the products of the soil. . . . Under primitive conditions this great heritage of the race became the common property of each succeeding generation. It was passed along by the simple but efficient procedures through which all essential knowledge descended from one generation to another. In modern times, however, living has become so complex and specialized that the old methods are no longer pursued, and under the conditions now prevailing a knowledge of garden practice comes only to a few. The old heritage is still shown, however, in the universal love that children have for gardening. . . . The recent stress of world famine has shown the imperative need of restoring the art of gardening to the educational curriculum, and the nation-wide success of the School Garden Army has indicated the most efficient way of adapting the study to modern conditions. The basic idea of the School Garden Army is to make the study and practice of gardening so essential a part of each school system that every child shall know the joy of watching plants grow and of learning through experience the productive power of the soil. There is no thought that all these pupils shall become farmers, but there is an idea that they shall develop into better citizens through their knowledge and experience.—U. S. S. G.A. Leaflet 92.

The Department of Agriculture at Washington issues many helpful bulletins and pamphlets. In extension work among boys and girls it coöperates with the State Boards of Agriculture, through which boys' and girls' canning clubs, pig clubs, and county-fair exhibits and demonstrations have been carried on with increasing interest and profit to all concerned. For special publications of this Federal Department of Agriculture, write to the

Division of Publications
Department of Agriculture
Washington, D. C.

or in case of any question to the

Office of Information
Department of Agriculture
Washington, D. C.

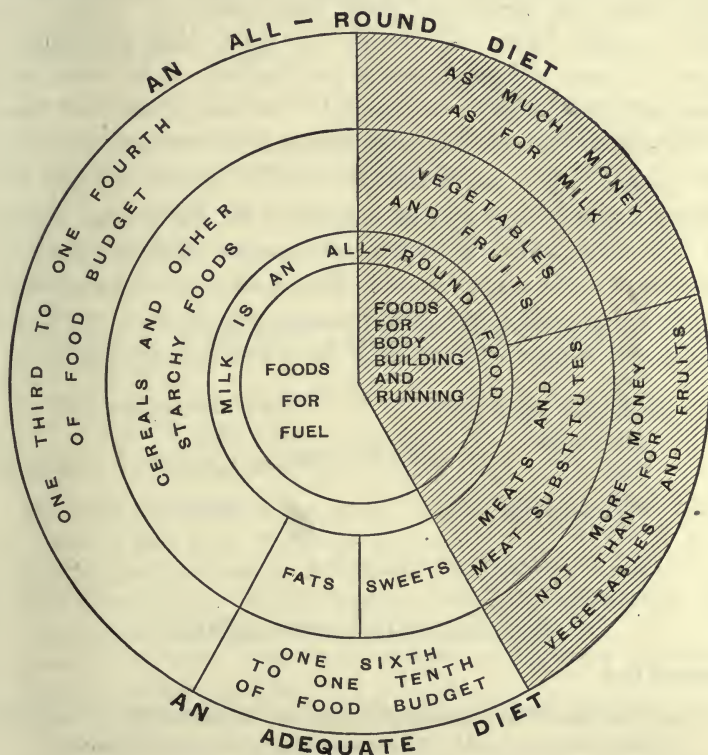
Be sure, however, to write also to the Board of Agriculture in your own state for information as to how boys and girls of the state are organized.

VIII

THREE MEALS A DAY

While few children choose or plan their meals, most children regulate to a considerable degree their food consumption by the effect upon the family purchases of their likes and dislikes, their choices and preferences. It is therefore worth while to make definite and practical their interest in the subject by charts and demonstrations. A distinctive feature of this book is the grouping of the three classes of foods taken primarily

for body-building and body-running as life foods. This brings to the child, in simple language, the new biological test of food



values, which emphasizes the function of a food in its living condition and the proved effect of the food on living creatures, as the term *fuel foods* reflects the earlier chemical analysis of foods and their grouping by calorie content.

In the chart "An All-round Diet" the basic division of foods as life foods and fuel foods is indicated at the center. This

is interpreted in the terms, made familiar by many government publications, of "the five food groups": (1) vegetables and fruits, (2) meats and meat substitutes, (3) cereals and other starchy foods, (4) sweets, (5) fats. This grouping is given in many articles, bulletins, and leaflets. It is useful as a practical guide, with its watchword: "Choose some food from every one of the five groups daily and not too much from any one group." The proportions here given indicate roughly the amounts approved by general agreement for the average family or individual, while the budget division in the outer circle is based on careful studies made in New York City and outside in families of varying means living under many types of conditions.

Another suggested proportion for a family is as follows:

The amount spent for vegetables fruit milk	} should equal	{ the amount spent for meat fish eggs
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IX

FOR FURTHER REFERENCE

General List

Food and the War. United States Food Administration. Houghton Mifflin Company. 1918. (Government price, 80 cents, postpaid.)

An excellent and extended summary of all the newer food information in convenient form.

LUSK, GRAHAM. The Fundamental Basis of Nutrition. Yale University Press, 1914.

A lecture published in six brief chapters for popular use. Other books on this subject by Dr. Lusk will also prove to be interesting, valuable, and simple.

MCCOLLUM, E. V. *The Newer Knowledge of Nutrition*. The Macmillan Company, 1918.

An invaluable pioneer work describing experiments and far-reaching conclusions in the new biological estimate of food values. Popular, readable, and suggestive.

ROSE, MARY S. *Feeding the Family*. The Macmillan Company, 1917. A popular and accurate study with full lists, plans, dietaries, and suggestions for every member of the household.

SHERMAN, HENRY C. *Chemistry of Food and Nutrition*. 2d ed. The Macmillan Company, 1918.

A complete and scientific textbook.

WARDALL, R. A. and WHITE, E. N. *A Study of Foods*. Ginn and Company, 1914.

A simple, all-round treatment of the subject from the school standpoint.

Pamphlets, Bulletins, Leaflets

The Child Health Alphabet. Child Health Organization, 156 Fifth Avenue, New York. (5 cents.)

Diet for the School Child. Child Health Organization. (10 cents.)

Food Allowances for Healthy Children. New York Association for Improving the Condition of the Poor. (10 cents.)

Food for the Family. New York Association for Improving the Condition of the Poor. (5 cents.)

Food Primer for the Home. New York Association for Improving the Condition of the Poor. (25 cents.)

Food for Young Children, *Farmers' Bulletin No. 717*, United States Department of Agriculture.

How to Conduct a Nutrition Class. Child Health Organization. (10 cents.)

How to Select Foods. I. What the Body Needs. *Farmers' Bulletin No. 808*, United States Department of Agriculture.

Milk, by D. R. Mendenhall. Children's Bureau, *Publication No. 35*.

Principles of Nutrition and the Nutritive Value of Foods, *Farmers' Bulletin No. 142*, United States Department of Agriculture.

Each year sees new literature published by the government on subjects connected with food values, home canning, the fireless cooker, the home garden, etc. Instead of listing here valuable publications on these subjects, we suggest sending direct to Washington for lists which will be readily furnished and from which selection can be made. The Children's Bureau is issuing publications on which teachers will find it worth while to keep themselves informed.

The experiments and demonstrations of the period of the war marked the beginning of a new era in food knowledge and food interest. Magazine articles, both of the war period and of to-day, present in attractive, readable form valuable matter which would in former years have been available only in technical, scientific theses. The teacher will find in current magazines and in the daily press supplementary material which will contribute to the interest of the schoolroom. Advertising literature issued by reliable firms contains much practical information.

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